



ENVIRONMENTAL IMPACT STATEMENT

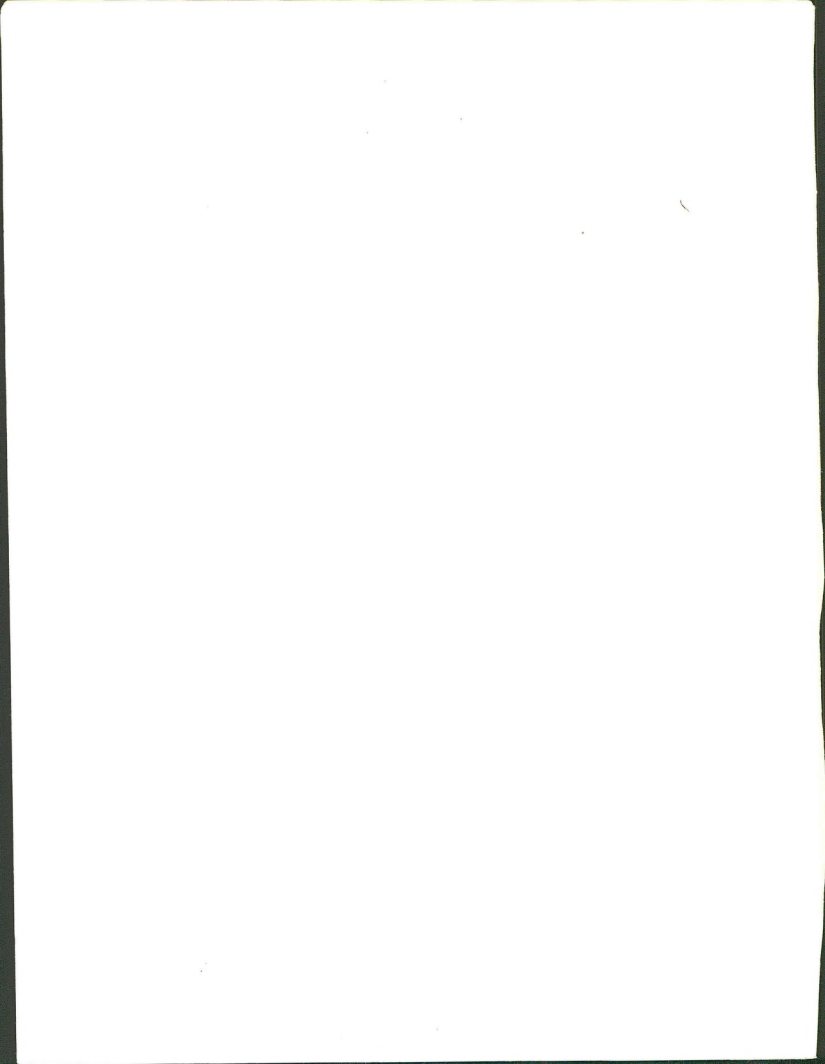
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United States
Department of the Interior



CHAPTER IX



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KAIPAROWITS

ENVIRONMENTAL IMPACT STATEMENT

CHAPTER IX CONSULTATION AND COORDINATION

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CHAPTER IX

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CHAPTER IX

CONSULTATION AND COORDINATION

This chapter includes a brief history of consultation and coordination undertaken concerning this statement, organization of the interagency team, federal, state and local agency contacts, adherence to mandatory federal laws, significant meetings held, and a list of government agencies and nongovernment organizations that received a copy of the draft statement and were requested to submit written comments.

It also contains a brief chronological history of the public review period, a description of how the public comments were reviewed and changes incorporated into the final statement, a brief analysis of general public comment, a brief history and description of the formal public hearings on the adequacy of the draft statement, a section on hearings testimony and BLM response, a section on written comments and BLM response and a brief paragraph on the participants' comments and BLM response.

Finally, this chapter contains copies of actual comments (letters printed in chronological order, Exhibit A) and copies of comments (letters received after the closing date of the public comment period, Exhibit B and C).

HISTORY OF CONSULTATION AND COORDINATION

By memorandum dated January 14, 1974, the Secretary of the Interior assigned the Bureau of Land Management lead responsibility for preparing an environmental impact statement on the proposed Kaiparowits project. As a result, the Associate Director, Bureau of Land Management, by memorandum dated January 25, 1974, directed the Utah State Director, to prepare the Environmental Impact Statement. Subsequently, by memorandum dated March 6, 1974, the Utah State Director requested formal assistance from the National Park Service, the Bureau of Sports Fisheries and Wildlife, Bureau of Reclamation, the Bureau of

Mines, the Bonneville Power Administration, and the U.S. Geological Survey. Shortly thereafter, by memorandum dated April 17, 1974, the Utah State Director set out to all members of the interagency team the assignments and responsibilities necessary for completing the statement.

The Bureau of Land Management received project proposal information as follows: The companies submitted their revised description of alternatives October 24, 1974. Final submission on description of proposed project was received November 4, 1974. The new highway proposal was received with cover letter dated November 21, 1974. The new town description was received December 4, 1974. The description of new town site alternatives was received January 6, 1975. Finally, the companies submitted a modification on the routing of the western transmission system as well as modification of the Nipple Bench site alternative which was received April 4, 1975.

The first preliminary draft was completed November 19, 1974. Consequently, an interagency review was held December 2 - 6, 1974. A second preliminary draft statement was submitted to the Department of the Interior for review January 30, 1975. The Department's review of the second preliminary draft was completed February 28, 1975.

By memorandum dated April 23, 1975, the Deputy Undersecretary directed the Interior agencies to submit comments on the draft statement by May 9, 1974. See section Consultation and Coordination in the Preparation of the Draft Environmental Statement - Federal contacts for additional information regarding the extent of federal participation.

ORGANIZATION OF INTERAGENCY TEAM FOR PREPARATION OF THE DRAFT STATEMENT

The primary interagency team effort involved Bureau of Land Management, Geological Survey, Fish and Wildlife Service, Bureau of Mines, Bureau of Outdoor Recreation, Bureau of Reclamation, Forest Service, and National Park Service.

On March 18 and 19, 1974, an EIS Team was organized under the Division of Resources, Utah State Office, Bureau of Land Management. Soon thereafter, conceptual plans and management techniques for the project were developed, including selection of team members, preparation of an outline, assignment of responsibilities, and scheduling of future activities.

Under supervision of a program manager, three working groups were established. Members of the Kaiparowits Plateau impact area group were from the Geological Survey, National Park Service, Fish and Wildlife Service, Bureau of Mines, Bureau of Outdoor Recreation, and Bureau of Reclamation. The transmission system impact area group received support from Fish and Wildlife Service and Forest Service. The limestone quarry impact area group received support from National Park Service, Forest Service and the State of Utah. The groups represented broad categories of environmental concern, including air quality, soils and vegetation, wildlife, socioeconomics, hydrology, geology and mining, land uses, recreation values, and ecological interrelationships.

The three groups were located in the Federal Building Annex in Salt Lake City, Utah. They utilized an interdisciplinary team approach in their analyses and writing activities during preparation of the statement. Group membership totaled approximately 55 persons in the beginning of the project. This number was reduced to about 20 for final preparation of the draft statement.

Periodic review was provided by Department of Interior representatives including BLM, Office of Environmental Project Review, and Office of the Solicitor. All reviews to assess technical and legal adequacy, as well as progress, were conducted in Salt Lake City.

CONSULTATION AND COORDINATION IN THE PREPARATION OF THE DRAFT ENVIRONMENTAL STATEMENT

Federal contacts

On July 2, 1974, Interior agency officials met with the utility companies' representatives to discuss information that had to be submitted as the basis for the environmental impact statement. An initial review and organization meeting was held July 15, 1974. Interior agencies, Office of Environmental Project Review, Solicitor, the companies, and State of Utah were represented. A meeting was held July 25, 1974, to discuss highways required for the project. Utah State and National Park Service officials attended. On August 28, 1974, Interior and company representatives met to review the companies' project description. A second meeting for review of the companies proposal was held September 19, 1974. The chart below lists the Interior and non-Interior agency contacts' latest comments regarding the interim draft statement prepared and submitted for comment in January, 1975. The Interior agencies' comments, were in accordance with the Undersecretary's memorandum of April 23, 1974, directing responses by May 9, 1975.

<u>Agency</u>	<u>Comments Received</u>	<u>Action Taken to Incorporate Comments in the Draft</u>
Department of the Interior		
Fish & Wildlife Service	Yes	No action necessary
National Park Service	Yes	No action necessary
Solicitor	Yes	Incorporated
Bureau of Indian Affairs	Yes	Incorporated
Bureau of Reclamation	Yes	Incorporated
Bureau of Mines	Yes	Incorporated
Geological Survey	Yes	No action necessary
Bureau of Outdoor Recreation	Yes	No action necessary
Department of Agriculture		
Forest Service	Yes	Incorporated

Environmental Protection Agency

Environmental Protection Agency, Denver, Colorado, was consulted and notified in compliance with the Clean Air Act.

Fish and Wildlife Service

In conformance with the Fish and Wildlife Coordination Act, Endangered Species Act, and Bald Eagle Protection Act, the Fish and Wildlife Service offices in Utah, Arizona, Nevada, and California were consulted in preparing this statement. They indicated that there were no jurisdictional problems in the statement.

Bureau of Outdoor Recreation

Bureau of Outdoor Recreation was contacted in the development of the recreation sections of the statement, and they indicated the statement was in compliance with the Land and Water Conservation Fund Act (Section 6), Wild and Scenic Rivers Act, and National Trails System Act.

Federal Highway Administration

Federal Highway Administration has been informed concerning development of the statement.

Advisory Council on Historic Preservation

Advisory Council on Historic Preservation was contacted concerning development of the proposed project. Necessary coordination activities have been completed. Refer to letter and memorandum of agreement on following pages IX-6 through IX-10. Approvals are still pending on the memorandum of agreement.

1522 K Street N.W.
Washington, D.C. 20005

Mr. William G. Leavell
Associate State Director
Utah State Office
Bureau of Land Management
P. O. Box 11505
Salt Lake City, Utah 84111

Rt	Clt	Inn	Date
	SD		
	<i>L</i>		<i>4/19</i>
<i>7</i>		<i>PET</i>	<i>4/19</i>

Action: *See Summary ASAP*

Info: *Reference LPS*

Discuss:

Dear Mr. Leavell:

The Advisory Council on Historic Preservation has received and reviewed the Bureau of Land Management's preliminary case report transmitted by your letter of September 12, 1975, for the Kaiparowits project in Utah, Arizona, Nevada and California, and proposed land transfers, permits, right-of-ways and other actions of various Federal agencies. We have prepared a Memorandum of Agreement pursuant to Section 800.5 of the Council's "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800) which is enclosed.

The Memorandum has been signed by Robert R. Garvey, Jr., Executive Director of the Advisory Council. Please sign and date the enclosed Memorandum and forward it to the Utah, Arizona, Nevada and California State Historic Preservation Officers for their dated signature. Thereafter, the Memorandum must be returned to this office for approval by Dr. Clement M. Silvestro, Chairman of the Council. After ratification by the Chairman of the Memorandum of Agreement a copy of the executed document will be provided for your records, and it will serve as evidence of agency compliance.

Thank you for your cooperation.

Sincerely yours,

John D. McDermott *for Me*
Director, Office of Review
and Compliance

Enclosure

The Council is an independent unit of the Executive Branch of the Federal Government charged by the Act of October 15, 1966 to advise the President and Congress in the field of Historic Preservation.

MEMORANDUM OF AGREEMENT

WHEREAS, the Department of the Interior, Bureau of Land Management as lead agency for ten agencies and bureaus of the Federal government is preparing an environmental statement for the Kaiparowits Power Project which will include facilities in Utah, Arizona, Nevada and California; and,

WHEREAS, the Department of the Interior, Bureau of Land Management has determined that the Kaiparowits Power Project as proposed may affect numerous cultural resources included in and others eligible for inclusion in the National Register of Historic Places; and,

WHEREAS, pursuant to Section 106 of the National Historic Preservation Act of 1966 and Sections 1(3) and 2(b) of Executive Order 11593, the Department of the Interior, Bureau of Land Management has requested the comments of the Advisory Council on Historic Preservation; and,

WHEREAS, pursuant to the procedures of the Advisory Council on Historic Preservation (36 C.F.R. Part 800), representatives of the Advisory Council on Historic Preservation, the Bureau of Land Management, and the Utah, Arizona, Nevada and California State Historic Preservation Officers have consulted and reviewed the undertaking to consider feasible and prudent alternatives to avoid or satisfactorily mitigate the adversely effect; now,

THEREFORE:

It is mutually agreed that implementation of the undertaking, in accordance with the following stipulations:

1. As a part of the specific permit approval process and land transfer actions required to implement the Kaiparowits Power Project, including but not limited to, the selection of an alignment within the power transmission corridors, access, roads, sites for plant, townsite and related facilities and the development of energy resources, or any other activity which results in the alteration of the existing environment, the Department of the Interior, Bureau of Land Management will conduct, or have conducted, surveys to identify historical, archeological, architectural and cultural resources which meet the criteria for inclusion in the National Register of Historic Places;

2. The Department of the Interior, Bureau of Land Management will obtain the comments of the appropriate State Historic Preservation Officer on the eligibility of the cultural resources identified in the surveys for inclusion in the National Register of Historic Places and request a determination of eligibility be made by the Secretary of the Interior for those properties that meet, or may meet, the criteria for inclusion in the National Register of Historic Places;
3. For each cultural resource determined by the Secretary of the Interior to be eligible for inclusion in, or included in, the National Register of Historic Places, the Department of the Interior, Bureau of Land Management will consult with the appropriate State Historic Preservation Officer to determine and assess the project's effects on that cultural property pursuant to Section 800.4 of the Advisory Council on Historic Preservation's "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800):
4. For each cultural resource determined by the Secretary of the Interior to be eligible for inclusion in, or included in, the National Register of Historic Places that could be affected by the project, the Department of the Interior, Bureau of Land Management will consider alternatives that would avoid adverse effects on the cultural property and provide the Advisory Council on Historic Preservation appropriate documentation in accordance with Section 800.4(d) of the "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800); and,
5. For each cultural resource determined by the Secretary of the Interior to be eligible for inclusion in, or included in, the National Register of Historic Places that would be adversely affected by the project, the Department of the Interior, Bureau of Land Management will:
 - a. request in writing, the comments of the Advisory Council on Historic Preservation,
 - b. notify the appropriate State Historic Preservation Officer of this request,
 - c. prepare a preliminary case report, and

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Memorandum of Agreement
Kaiparowits Power Project

- d. proceed with the consultation process as set forth in Section 800.5 of the "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800);

will avoid or satisfactorily mitigate any adverse effects on the above-mentioned properties.

(date)

Robert R. Garvey, Jr.
Executive Director
Advisory Council on Historic
Preservation

(date)

Bureau of Land Management
Department of the Interior

(date)

Utah State Historic Preservation
Officer

(date)

Arizona State Historic Preservation
Officer

(date)

Nevada State Historic Preservation
Officer

Page 4

Memorandum of Agreement
Kaiparowits Power Project

(date)
California State Historic Preservation
Officer

(date)
Dr. Clement M. Silvestro
Chairman
Advisory Council on Historic Preservation

State and local contacts

State Historic Preservation Officers in Utah, Arizona, Nevada and California were contacted in compliance with the National Historic Preservation Act. Officers contacted were Mr. Melvin T. Smith (Utah), Ms. Dorothy H. Hall (Arizona), Mr. Eric R. Cronkhite (Nevada), and Mr. Russell W. Porter (California). Their responses were received and considered in preparing the statement.

Utah

State

A close working relationship was established with state and local agencies in Utah. The Kaiparowits Planning and Advisory Development Council (an agent for state and local authorities), has been kept informed consistent with their jurisdictional interests in the Kaiparowits project. All divisions of Utah State Government having jurisdictional interests in the project have been contacted and supplied statement data. A complete list follows:

- Office of the Governor
- Planning Coordinator
- Department of Community Affairs
- Utah Road Commissioners
- Highway Department
- Utah Highways Environmental Council
- Division of Parks and Recreation
- Division of State Lands
- Division of Water Resources
- Division of Wildlife Resources
- Division of Water Rights
- Division of Health, Air Quality Section
- Tax Commission
- University of Utah
- Utah State University (BLM consultant)
- Weber State College (BLM consultant)
- Industrial Promotion

Local

County Commissioners in Kane and Garfield counties have been consulted regarding preparation of the statement. The city of Cannonville has been consulted also.

Arizona

The following state and local agencies have been contacted in preparation of the statement:

State

Clearing House
Lands Department
Parks Board
Game and Fish Department, Phoenix Office
Arizona Corporation Commission, Utilities Division
State Water Commissioner
Northern Arizona University
Bureau of Mines
Highways Department
Department of Health, Air Quality Section

Local

Planning Department, Mohave County
Parks Department, Mohave County
Planning Department, Coconino County
Parks Department, Coconino County
Planning Department, Yavapai County
Parks Department, Yavapai County
Planning Department, Maricopa County
Parks Department, Maricopa County
Mohave County Museum at Kingman
City Clerk, City of Page

Nevada

The following agencies have been contacted in preparation of the statement.

State

Clearing House
Department of Fish and Game
University of Nevada at Las Vegas

Local

Clark County Planning Department

California

The following agencies have been contacted in preparation of the statement.

State

Clearing House
Resources Agency of California,
 Department of Food and Agriculture
 Department of Transportation
 Department of Conservation
 Department of Fish and Game
 Department of Parks and Recreation
 Department of Water Resources
Water Resources Control Board
Colorado River Board of California
Public Utilities Commission
University of California at Riverside,
 Archaeological Research Unit
University of California, Santa Barbara (BLM consultant)

Local

Board of Supervisors, Riverside County
Parks Department, Riverside County
Planning Department, Riverside County
Airports Department, Riverside County
Board of Supervisors, Orange County
Planning Department, Orange County
Planning Department, City of Orange
Board of Supervisors, San Bernardino County
Planning Department, San Bernardino County
Environmental Improvement Agency, San Bernardino County
Curator of Earth Sciences, San Bernardino County Museum
Department of Parks and Recreation, Los Angeles County
Planning Division, San Diego County
Park Development Division, San Diego County
Southern California Association of Governments

Other contacts

During March, 1974, a letter from the Utah State Director was sent to Utah conservation and environmental organizations and other concerned groups announcing the Kaiparowits project and requesting their views and participation in preparation of the statement.

On May 7, 1974, a public meeting on the Kaiparowits power project was held in Salt Lake City, Utah. Conservationists, environmentalists, state and local government officials, company representatives and BLM officials attended.

The Navajo Tribe has been consulted in preparation of the draft statement. The official representative of the Navajo Tribe was present at the Inter-agency review sessions. He provided the transmission system group with information concerning the impact of the transmission system on Navajo lands.

The John Muir Institute for Environmental Studies, Lake Powell Research Project, and Western Systems Coordinating Council were also consulted.

COORDINATION IN REVIEW OF DRAFT STATEMENT

Organizations that received a copy of the draft statement and were requested to submit written comments.

Federal

- *Department of Transportation
- *Department of Agriculture
 - * Forest Service
 - * Soil Conservation Service
- *Environmental Protection Agency
- *Department of the Interior
 - * Bureau of Reclamation
 - Bureau of Outdoor Recreation
 - * Fish and Wildlife Service
 - * Geological Survey
 - * National Park Service
 - * Bureau of Indian Affairs
 - * Bureau of Mines
 - * Mining Enforcement and Safety Administration
 - * Bonneville Power Administration
 - Office of Coal Research
 - Office of Land Use and Water Planning
 - Office of Water Resources Research
 - Office of the Solicitor
 - Power Marketing Administration
 - Office of Saline Water
- Federal Power Commission
- *Department of Health, Education and Welfare

*Agencies and organizations which prepared written responses to the draft statement.

*Energy Research and Development Administration
*Federal Energy Administration
*Department of Commerce
* National Oceanic and Atmospheric Administration
*Tennessee Valley Authority
*Federal Aviation Administration
*National Historical Advisory Council
*Army Corps of Engineers
*Department of Housing & Urban Development

Department of Labor, Occupational Safety & Health Administration

State

*State of Utah
Governor's Clearing House
Utah Department of Highways
*State of Arizona
* Governor's Clearing House
*State of Nevada
Governor's Clearing House
*State of California
Governor's Clearing House
Upper Colorado River Basin Commission

Local

Board of County Commissioners
Washington (Utah)
* Garfield (Utah)
* Kane (Utah)
Coconino (Arizona)

*Agencies and organizations which prepared written responses to the draft statement.

- Yavapai (Arizona)
- * Maricopa (Arizona)
- * Mohave (Arizona)
- * Clark (Nevada)
- Lincoln (Nevada)
- * Orange (California)
- * San Bernardino (California)

Non-government organizations

*Sierra Club

Utah Audubon Society

Izaak Walton League - Utah Division

Rocky Mountain Center on Environment

National Stock Growers Association

Utah Wool Growers Association

*Utah Mining Association

The Wilderness Society

*Environmental Defense Fund, Rocky Mountain/Great Plains

The Institute of Ecology

Natural Resources Defense Council, Inc.

Enchanted Wilderness Association

*Escalante Wilderness Committee

*Utah Environment Center

Wasatch Mountain Club

Utah Water Users Association

*Rocky Mountain Federation of Mineralogical Societies

Women's Conservation Council of Utah

Utah Nature Study Society

*Agencies and organizations which prepared written responses to the draft statement.

Archaeological Society of Utah
 Rocky Mountain Sportsman Association
 *Utah Wildlife and Outdoor Recreation Federation
 *Mineralogical Society of Utah
 Pro-Utah, Inc.
 Utah Sportsman Association
 Defenders of the Outdoor Heritage
 Utah Cattlemen's Association
 Save Our Canyons Committee
 *Advisory Commission on Arizona Environment
 *Arizona Archaeological Society, Inc.
 Colorado Plateau Environment Advisory Council
 Arizona Cattle Growers Association
 Arizona Conservation Council
 *Arizona Desert Bighorn Sheep Society, Inc.
 Arizona Environmental Education Council, Inc.
 *Arizona Mining Association
 *Arizona Wildlife Federation
 Arizona Wool Growers Association
 Arizonans in Defense of the Environment, Inc.
 Common Cause
 Environmental Awareness
 Environmental Council of Arizona
 Defenders of Wildlife
 Good Earth
 Mearns Wildlife Society
 National Wildlife Federation

*Agencies and organizations which prepared written responses to the draft statement.

Nature Conservancy
 Western Rockhound Association
 *Friends of the Earth
 Tucson Wildlife Unlimited, Inc.
 SWRCC Wilderness Society
 Nevada Wildlife Federation
 Wild Horse Organized Assistance
 Nevada Conservation Forum
 Conservancy Resource Center
 *Desert Protective Council
 California Wildlife Federation
 Society of Conservation of Bighorn Sheep
 Inland Com. Conservation Clubs
 *Ecology Center of Southern California
 Utah Lung Association
 Council on Utah Resources
 Canyon Country Coalition
 *League of Women Voters
 Museum of Northern Arizona
 Utah Farm Bureau

Tribal organizations

Yavapai-Apache Indian Community Clarkdale, Arizona	Kaibab - Paiute Tribe Fredonia, Arizona
Colorado River Indian Tribes Parker, Arizona	Hopi Tribal Council Oraibi, Arizona
Harold Tso, Navajo Tribe Window Rock, Arizona	Hualapai Tribal Council Peach Springs, Arizona

*Agencies and organizations which prepared written responses to the draft statement.

PUBLIC COMMENTS AND RESPONSES

Public comments period

The public comment period was scheduled to provide the public the opportunity to review and then offer comment on the adequacy of the draft environmental impact statement.

The draft EIS was issued July 25, 1975. The notice of availability was published in the July 30, 1975 issue of the Federal Register on page 31965. The notice also announced a 60-day public review period ending September 30, 1975, and included a schedule of formal public hearings on the draft EIS to be held at five locations with exact times to be announced at a later date. After publication of the notice of availability, copies of the draft EIS were mailed to federal, state, and local government agencies and nongovernment organizations, such as conservation groups, for their review and comment.

Over 1,400 copies of the draft EIS and approximately 900 copies of the summary of the draft EIS have been distributed. Reading copies were made available for public review at the following locations: 14 Bureau of Land Management Offices in Utah, Arizona, Nevada, California, and Washington, D.C.; 12 Forest Service offices and 15 public libraries in the same four states. In addition to the Federal Register notice, a national news release was made from the Department of the Interior, Washington, D.C., July 30, 1975. A similar news release was made, on the same date, from the Utah State Office, Bureau of Land Management, to 41 newspapers, 41 radio stations, six TV stations, two news services and about 25 special interest groups within the State of Utah.

The schedule for the formal public hearings was published in the Federal Register August 19, 1975, page 36153. The meetings were held in Salt Lake City and Kanab, Utah; Phoenix, Arizona; Las Vegas, Nevada; and San Bernardino and Riverside, California; the week of September 15 through 19, 1975.

A second news release announcing the formal public hearings was issued on August 19, 1975. Both news releases were then sent to 31 post offices in small communities along the entire proposed transmission route for placement on their public bulletin boards.

A third news release was issued September 12, 1975, concerning the public hearings and also announcing a location change for one of the hearing sessions in Las Vegas, Nevada.

A fourth news release dated September 24, 1975 and Federal Register notice dated September 29, 1975 (page 44591) announced a 45-day extension of the review period due to increased public interest. The public comment period ended November 14, 1975 after a review period of 105 days.

Handling and review procedures for public comments

Due to wide public awareness, the President, Secretary of the Interior and Utah State Director, Bureau of Land Management, received many comments on the draft environmental impact statement. Oral testimony was received at formal public hearings; written comments were received from federal and state agencies, private organizations and individuals. The participating utility companies also submitted a large number of comments.

All written comments and the hearing transcripts have been sent with the final environmental statement to the Secretary of the Interior and the Council on Environmental Quality for review and will also be available for public inspection at the State Director's Office, Bureau of Land Management, Federal Building, Salt Lake City, Utah.

All comments were reviewed to determine if they met the criteria established for consideration by the environmental staff analysts in preparation of the final EIS. In order to be considered, comments had to discuss the adequacy of the draft EIS. Thus, comments which presented new data, questioned facts

and/or analyses, and raised questions or issues bearing directly upon the draft EIS were fully considered and evaluated. Such comments were called "valid" comments and were then assigned to environmental staff analysts for evaluation and subsequent changes or insertion in the text of the draft EIS where necessary. Once a comment or issue has been responded to fully, the initial response is not repeated. The reader is referred to initial response in answer to all similar comments.

The complete letters from all federal and state agencies, private organizations, and "recognized experts" are reproduced under the section titled: Exhibit A, Actual comments letters in chronological order. Other valid comment letters were responded to, but these letters are not reproduced in this statement.

Letters which did not contain valid comments were divided into three groups: those for the project; those against the project; and those neutral to the project. They were then counted and placed in the official Kaiparowits file. Final tabulation of the count was as follows:

<u>For</u>	<u>Against</u>	<u>Neutral</u>
837	4,933	23

Student comments

Student response to the Kaiparowits Project should be noted. University of Colorado students studying geography submitted extensive reports dealing with effects of the project upon the surrounding resource values of the Kaiparowits Plateau. Their analyses were based upon two interim working drafts, not the published draft statement. However, their comments were forwarded to responsible environmental staff analysts for review and consideration. Written comments were also received from students attending Panguitch Elementary School, Panguitch, Utah, and St. Joseph High School, Ogden, Utah.

Comments received against the proposed Arizona Strip transmission line

Approximately 100 letters were received from persons objecting to the construction of the transmission line across the Arizona Strip.

General comments

Many comments of both a general and specific nature were received and reviewed. All specific comments will be discussed under the hearing or written comments sections. The general comments are discussed here.

Some expressed the belief that the draft environmental statement was recommending a particular course of action or was biased in favor of the participants. It is not the purpose of the statement to make recommendations or to take a position favoring the participants. To the extent possible, the statement factually portrays potential impacts of proposed actions and various alternatives to the proposed development. Although certain alternatives were discussed and analyzed, this does not indicate that the statement is recommending that these alternatives be implemented. The purpose of the statement is to supply the decision-maker a range of possible alternatives that may be available for consideration.

Concern was also expressed by some that the statement would allow development without full knowledge of the potential impacts. This concern stems from statements in the document that certain data are not available or that the extent and magnitude of certain impacts are unknown at this time. The authors of this statement are not taking a position on development. The statement is not the decision document but comprises one element in the decision-making process. The purpose of the statement is to provide environmental information to the decision-maker. This information describes possible environmental impacts that may occur from the proposed actions if allowed and any data gaps which may prohibit a more thorough and comprehensive analysis of some of the potential impacts. The

decision-maker must determine if the proposed development should be allowed to proceed prior to development of data to fill the indicated gaps. This determination will be made by balancing the environmental impacts identified in the statement with the economic, technical and policy issues involved.

Many of the comments indicated the need for a regional study to evaluate the impact of present and proposed power plants on the environment of the entire southwestern United States. Due to the nature of such a study, it would be in a constant state of reevaluation and revision as new data became available and understanding of impacts became known. The scope of the Kaiparowits Environmental Impact Statement, as established by the Department, included only the evaluation and analyses of impacts and alternatives of the proposed project and related facilities upon the surrounding environment.

Questions were also raised as to why certain items were not included in the section on mitigation measures, particularly with respect to socioeconomics, site abandonment and reclamation, wildlife, etc. No mitigating measures were mentioned that could not be legally required under existing federal, state, or local statutes. If the mitigating measures section were to contain a listing of all desirable management measures, it could mislead the reader as well as the decision-maker into believing everything was well in hand when in all probability, there may be no legal authority to enforce these measures. Therefore, only those measures which presently have a legal basis for enforcement were discussed.

The discussion of specific comments on major and minor issues is presented in the following sections on hearing comments and written comments.

Hearings

The Department of the Interior conducted 5 days of formal public hearings on the adequacy of the Draft Kaiparowits EIS from September 15 to

September 19, 1975. An Interior Department Administrative Law Judge presided over the hearings which were recorded verbatim by professional court reporters. Copies of the full hearings' transcripts were made available for public review in Bureau of Land Management Offices in Salt Lake City, Utah; Kanab, Utah; Phoenix, Arizona; Las Vegas, Nevada; and Riverside, California. The hearings panel consisted of employees from the Bureau of Land Management including the Assistant Secretary for Land and Water (first session in Salt Lake City); Utah State Director; Chief, Environmental Project Staff (Utah State Office); Kaiparowits Team Leader (Utah State Office); and Air Quality Specialist (Utah State Office). The BLM Transmission System Team Leader joined the panel at Phoenix for hearings held in Arizona, Nevada and California. BLM Kaiparowits State Coordinators also served on the hearings panel for sessions held in their states. The hearings were widely announced as indicated in the public comments period section.

The following summarizes the hearing locations, dates, attendance, and number of people who gave testimony.

Public Hearings

<u>Location</u>	<u>Date and Time</u>	<u>Attendance</u>	<u>Number Testifying</u>
Salt Lake City, Utah	7/15/75 9 p.m.	150	14
Salt Lake City, Utah	7/15/75 1 p.m.	150	13
Salt Lake City, Utah	7/15/75 7 p.m.	150	18
Kanab, Utah	7/16/75 1 p.m.	130	20
Kanab, Utah	7/16/75 7 p.m.	60	12
Phoenix, Arizona	7/17/75 1 p.m.	60	10
Phoenix, Arizona	7/17/75 7 p.m.	15	1
Las Vegas, Nevada	7/18/75 1 p.m.	45	5
Las Vegas, Nevada	7/18/75 7 p.m.	45	8
San Bernardino, Calif.	7/19/75 1 p.m.	90	32
Riverside, California	7/19/75 7 p.m.	<u>150</u>	<u>21</u>
	Total 1,045		Total 154

Response to the comments of those individuals who spoke concerning some aspect of the EIS is in their order of appearance at the hearings beginning in Salt Lake City and ending in Riverside, California. For example, the first witness who met this criteria was Ms. Laurie Holley, who testified in Salt Lake City, Utah. Her name is listed first, then the location where she testified. The comments considered and the appropriate responses are also numbered under each witness.

Where a witness made an oral presentation and then submitted a lengthy exhibit as his or her full statement, only the full statement has been answered.

Comments which were ambiguous in nature or for which no specific reply was deemed necessary are not addressed below. Comments received and corresponding responses follow.

Individuals testifying at hearings

<u>Speaker</u>	<u>Representing</u>	<u>Location</u>	<u>Page Number</u>
L. Holley	Town President, Cannonville, UT	Salt Lake City	IX-28
J. Garn	Constituents	Salt Lake City	IX-28
C. Rampton	Constituents	Salt Lake City	IX-28
Coyote	Nat'l Representative Native People	Salt Lake City	IX-29
J. Spence	Self	Salt Lake City	IX-30
K. Sleight	Wonderland Expedition Company	Salt Lake City	IX-34
B. Beard	Self	Salt Lake City	IX-36
J. McComb	Sierra Club	Salt Lake City	IX-38
M. Williams	John Muir Institute	Salt Lake City	IX-39
J. Coles	Self	Salt Lake City	IX-44
R. Rudolph	Friends of the Earth	Salt Lake City	IX-46
F. Crall	Utah Audubon Society	Salt Lake City	IX-50
D. Weins	Self	Salt Lake City	IX-55
P. Cox	Self	Salt Lake City	IX-56
S. Janke	Utah Clear	Salt Lake City	IX-58
J. Viavant	Self	Salt Lake City	IX-61
G. Swensen	Self	Salt Lake City	IX-62
G. Atwood	Constituents (Utah State Legislature)	Salt Lake City	IX-65
Q. Phillips	Self	Salt Lake City	IX-66
G. Anderson	Canyon Country Coalition	Salt Lake City	IX-68
L. Gordon	Council on Utah Resources	Kanab	IX-70
R. Hassell	Self	Kanab	IX-73
R. Hamblin	Self	Kanab	IX-87
B. Wood	Self	Kanab	IX-90
L. Garrison	Self	Kanab	IX-91
R. Coshland	National Parks and Conservation Assoc.	Phoenix	IX-92
R. Scott	Arizona State Dept. of Health Services	Phoenix	IX-92
G. McKennis	Self	Phoenix	IX-93
K. Dahl	Friends of the Earth (Arizona)	Phoenix	IX-93
J. McComb	Sierra Club	Phoenix	IX-94
A. Zorn	League of Women Voters, Las Vegas Valley	Las Vegas	IX-95
H. Booth	National Public Lands Task Force	Las Vegas	IX-100
D. Talvitie	Self	Las Vegas	IX-103
R. Snelling	Self	Las Vegas	IX-107
P. Fradkin	The Resources Agency, State of Calif.	San Bernardino	IX-109
B. Mills	Morongo Indian Reservation	San Bernardino	IX-111
M. Ericksen	Sierra Club	San Bernardino	IX-111
I. Eastvold	Desert Watch Society for California	San Bernardino	IX-112
A. Johnson	California Federation of Western Outdoor Clubs	San Bernardino	IX-116
C. Bell	High Desert Environmental Defense Fund	San Bernardino	IX-118
O. Fast Wolf	Meta Tantay Indian Foundation	Riverside	IX-119
R. McDonnel	Self	Riverside	IX-119
J. Shaw	Foothill Corridor Committee	Riverside	IX-120
R. Marting	Energy Community Service District	Riverside	IX-121
J. Laprevote	Ecology Center of Southern California	Riverside	IX-121
C. Randolph	Self	Riverside	IX-123

Hearing comments and responses

L. Holley - Salt Lake City, Utah

Comment: I feel that greater emphasis was placed on the East Clark Bench site than on the other sites, that there is additional information in this Call Engineering study possibly that should have been included in the Draft Statement that was not regarding the Fourmile site.

Response: East Clark Bench was analyzed as the primary town site throughout the first seven chapters of the Draft Statement because it was designated as such in the proposal submitted by the Kaiparowits Planning and Development Advisory Council (a Utah governmental body). Alternative town sites were analyzed only in Chapter VIII, but a balanced comparative analysis was given for all optional sites, including East Clark Bench and Fourmile Bench. Kaiser Engineers provided a preliminary town plan for Fourmile Bench; therefore, Chapter VIII of the Final Statement has been revised to include pertinent information from that plan.

J. Garn - Salt Lake City, Utah

Comment: I have some concerns that it is not adequate as far as the economic benefits, that it has not addressed itself enough to the problems of people. We seem to do that in most environmental impact statements. We are greatly concerned, as we should be, about the biological impact and the impact on the natural fauna and animals in the area. I do not think we consider ourselves enough with the economic impact and the sociological impact on people that it has in the area.

Response: The text of Chapters III and V, Socioeconomic Sections, have been revised to discuss some potential short and long-term impacts.

C. Rampton - Salt Lake City, Utah

Comment: Well now, if you are coming back to us and saying, "We are going to mitigate against the project of yours because it's going to increase salinity

downstream," then you are requiring this state of Utah to make more than the agreed contribution to the control of salinity in the Lower Colorado River Basin. I repeat, I can't believe it's really a serious thing here as it concerns 50,000 acre-feet, but it's a matter of great concern to me if this becomes a precedent, because it would be a precedent against any further diversion of the Colorado River anywhere in the State of Utah, or the states of Wyoming or Colorado for that matter. And so I would hope that the Environmental Impact Statement would not try to rework ground that was worked over two decades ago when the problem was addressed, assessed and taken care of and where major rights of citizens have been built upon the treaty that was arrived at that time.

Response: Chapter III of the EIS has been revised to state that the Colorado River Salinity Control Act recognizes salinity in the Colorado River as a basin-wide problem that must be alleviated so that development of compact-allocated water can continue while salinity is being controlled. The EIS has also been revised to state that the projects under the Colorado River Water Quality Improvement Act are financed almost entirely by federal funds and funds from hydroelectric power generation.

Coyote - Salt Lake City, Utah

Comment: They are beginning to understand their problems socially. And I definitely feel that another project such as this interfering on a Navajo reservation which is huge and the damage is very minimal, but the right-of-way needed for transmission lines going across Morongo Reservation in Southern California would almost erase what little is left to that land base.

Response: The proposed transmission system would cross portions of two Indian reservations in California, they are the Aqua Caliente and the Morongo. The Aqua Caliente Reservation contains approximately 25,500 acres and the Morongo Reservation about 30,000 acres. Assuming a right-of-way width of 330 feet,

approximately 80 acres and 150 acres respectively, would be encumbered, although actual occupied areas for roads and towers would be much less. Most present land uses would continue. One land use that would be eliminated is homesite development; however, this has not been a use on the Morongo Reservation in the past due to extremely rough topography. The right-of-way across Indian lands will be a source of income to the reservations. (This information was added to Chapter III of the Final Statement.)

J. Spence - Salt Lake City, Utah

1. Comment: If the equipment does not work at the standards which the Kaiparowits project proposes that it will, I think later on in this hearing we will have some other information on it from Dr. Williams who has more expertise in this matter than I have. In any case, it is pointed out in the Environmental Impact Statement although the 99.5 per cent and 90 per cent figures are used routinely, they may not in fact be that which may occur.

Response: Additional data has been added in the Final Impact Statement discussing performance of electrostatic precipitators and the expected performance of the Kaiparowits plant. In addition, proposed emission controls are discussed as well as calculated emission controls as required by applicable air quality regulations.

2. Comment: If one year's production, using the figures produced in the EIS following that production of sulfur dioxide, were to go into the lake and the lake was completely mixed and there was no buffering capacity - obviously, these are very bad assumptions. The only point I'm making with these calculations is to give you an idea of what these mean in terms of full amounts. So we would change the pH of the lake from 7 to 5 instead of 7 at present. That's a hundred-fold increase in acidity. Obviously, that will not occur.

However, there is a serious problem, I believe, in respect to some of the shallow bays immediately adjacent to the Kaiparowits area. If sufficient sulfuric acid falls into these bays the pH of these bays could drop considerably producing serious effects. Rainfall, for instance, in Northern Europe and Eastern United States has been measured with a pH of 3.5 which is an enormous acidity. This is due to sulfur dioxide being emitted by various industrial processes.

Response: Acid rain has been identified as a serious problem in humid and highly industrialized areas such as the eastern United States and northern European countries (Likens and Bormann, Science 184:1176-1179, June 1974).

The potential for vegetation damage in the West, and particularly the Kaiparowits area from acid rain is very much smaller because of lower humidity and rainfall, general lack of industrialization in the area, as well as the use of low sulfur coals, proposed or required emission controls, higher pH soils, and the buffering capacity of the soils and dusts of the area.

3. Comment: I would like to mention briefly the problem relating to nitrogen dioxide or nitrogen oxide emissions. This is, in my opinion, one of the most important weaknesses of the EIS. It has indicated 250 tons per day will be emitted. Now, what does that mean? To get a handle on that, I will just make rough calculations. This is approximately equivalent to - with certain assumptions which I will be glad to furnish - to about 15 times the total amount of nitrogen oxides emitted by all the cars operating in Salt Lake City each day. This is equivalent roughly to the full amount of nitrogen oxides emitted by all the automobiles operating in Los Angeles. In other words, it's an enormous amount of nitrogen dioxide.

And the levels which are predicted by the models which have been indicated in the EIS, leave one with a considerable feeling of doubt as to their

validity. The three-hour levels and the 24-hour levels which are not indicated at all are very high. They approach - well, I could give the data - .43 parts per million or .11 parts per million using the model the EIS. If we use the Southwest Energy Study model these are five to twenty times higher. These are very high levels of nitrogen dioxide. There is a possibility if the model used is in error by a factor of 10, which it may be, then the ambient air quality standards of nitrogen oxide for a Class 2 area may be in fact exceeded.

Response: The emission of nitrogen oxides has been discussed in the Final Statement with reference to the emission limitations of the Federal New Source Performance Standards and the Federal Ambient Air Quality Standards. The power plant, as proposed, would meet the limitations set by these regulations. No limitations are indicated for a Class II or Class I area under the Prevention of Significant Deterioration Regulations.

4. Comment: Furthermore, another problem relating to nitrogen oxides, which is not mentioned at all, is a photochemical oxidation of nitrogen dioxide which produces oxygen atoms which in turn react with oxygen in the atmosphere, the ozone, a photochemical oxygen of a very dangerous pollutant. The ozone is primarily responsible in a very direct way for most of these photochemical smog in the Los Angeles area. Every case known where there are large levels of nitrogen dioxide it is also accompanied by large levels of ozone.

Now, one can make calculations again using a model and I would not attach any validity to these because I don't believe the data is very good and the assumptions are very poor. What one can calculate is a ballpark figure that about .08 parts per million of ozone or even higher may occur under certain conditions. This is in excess of the levels that are required, for the required federal levels may not be exceeded once per year.

Now I wouldn't want to attach my significance to that figure. My point is simply that the problem has not been treated. It may be a very serious problem. Ozone has a very serious effect on plant life and animal life, and if it gets high enough, of course, on the workers at the industrial sites. And I would like to make the point this should be studied much more effectively, that the Environmental Impact Statement completely ignores what I consider to be a major problem.

Response: A discussion of ozone has been added to the Final Statement.

5. Comment: The third point, mercury emissions by the plant. The EIS does refer to this in a kind of a general way indicating there is a problem. I would say it's a very serious problem. Mercury is one of the most lethal pollutants known. Not mercury itself or any of its ordinary inorganic compounds. They are relatively innocuous. Unfortunately, it's converted by bacteria bottom sediments to methyl mercury which is one of the most lethal compounds I know of, chemically speaking. It is probably also the most effective chemical mutagen known. At any rate, the plants and the small animal species accumulate this and, of course, the fish feed on it.

At the present time, the mercury levels in large game fish - and this is reported in the Environmental Impact Statement - exceed the FDA standards for fish. They exceed 500 parts per million in mercury. It is estimated that if you take the amount of mercury emitted by the plant and you make some reasonable assumptions about how much is going to go into the lake and so on - and these are all open to question, I realize - you would increase the total mercury content of the lake by about 27 per cent each year. That is 27 per cent on top of the amount which is already being put in by natural resources which, incidentally, is very high. That would bring the level in the fish up to about 769 parts per million. If 500 is the FDA recommendation level, you can see what's going to happen.

If you add to this the total amount of mercury over a long period of time from this plant, add in other plants, it is almost certain that the fishing for game fish will be destroyed or - at least not destroyed - no one would want to eat one. I wouldn't want to eat one now as a matter of fact.

Just to give you an idea also of the total amount of mercury that it is equivalent to, at the present time the waters of Lake Powell have a hundredth of a part of a million of mercury. If you do a simple calculation this adds up to 734 pounds of mercury in all the water of Lake Powell. The plant will emit 1,168 pounds of mercury; in other words, considerably more emissions than is already present in the water. That doesn't include the bottom sediments where most of the mercury is.

At any rate, the mercury problem is a very serious one. It's very hard to analyze. It's difficult to know where the mercury is coming from besides from the plants. It's hard to know where it's going to go and these all require additional study if you wish to maintain any kind of a game fishery in Lake Powell or perhaps in some of the rivers which are in the vicinity.

Response: The discussion of potential impacts from mercury emission from Kaiparowits has been expanded in the Final Statement.

K. Sleight - Salt Lake City, Utah

1. Comment: What is going to be the effect of all these tunnels and so forth that this project is going to generate?

Response: If the tunnel in question is the water intake for the pumping plant, the impacts were discussed in Chapter III, page 153, of the Draft EIS. If the question refers to mine tunnels, the impacts were discussed in Chapter III of the Draft EIS primarily in the section on Geology and Topography, beginning on page 58.

2. Comment: I can't get any information from the government sources. That's the U.S. Coast Guard and in the EIS I don't see any mention of this fact on the Coast Guard involvement

Response: The U.S. Coast Guard has enforcement jurisdiction over the waters of Lake Powell, but had virtually no involvement in preparation of the EIS. Because the possible construction of Kaiparowits would not alter, revise, or bear directly on their enforcement jurisdiction, they were not consulted on the impact statement. They were also not included in the list of "Federal, State and Local entities with jurisdiction and expertise" at the beginning of Chapter I of the statement.

3. Comment: I want to know also the effect that it's going to have on Grand Canyon because I do a lot of boating trips in Grand and it's one of the most beautiful canyons left that's been unexploited relatively so. What effect will the air pollution have there?

Response: There is a possibility that visual air pollution would drift into Grand Canyon. Technical data or methodology does not exist to make accurate predictions of the frequency and magnitude of visual air pollution drifting from the proposed plant into Grand Canyon.

4. Comment: We want to know, since we drink the Colorado River water, is that mercury poisoning going to hurt us? What effect will all these trace elements and so forth have as far as swimming and drinking Colorado River water? We are dependent upon it for our customers.

Response: Available data indicate that present mercury levels in Lake Powell water are well within the maximum allowable limits recommended by the Public Health Service for drinking water. The rate of increased mercury levels in the lake resulting from the proposed project cannot be predicted, but would be monitored by the water quality monitoring program. Presumably corrective measures

would be taken under legal provisions of EPA to prevent mercury or other toxic elements from exceeding safe limits in drinking water.

B. Beard - Salt Lake City, Utah

1. Comment: Okay, a few things which I feel should be added to the end statement of just the draft but I felt it should be in the end statement are on Page 172 quoting: "Knowledge of the spotted bat is insufficient to determine whether the proposed transmission line would have any impact upon this endangered species." I feel that something should be included in the Environmental Impact Statement, that final statement which will determine what will happen to this species. Another quote on Page 172, "Effects upon the mountain plover are not known at the present time." I'd like to see information on this in the draft and the final statement also.

Response: Due to limited available information, we are unable to state anything more definitive than that already present in the Draft EIS.

2. Comment: Okay, quoting from the Environmental Impact Statement on Page 148: "Actual numbers or concentrations of protected or rare and endangered plant species are not known, however, some protected families such as the cactaceae and the liliaceae have large numbers of species that occur over much of the proposed routes." I'd like to see in the final statement again, if what species are up there that are endangered and rare or if there are any at all.

Okay, another thing I feel should be added in the final statement quoting on Page 145, Chapter 3: "Quantitative impacts in terms of number of plants, species, et cetera cannot be predicted because data are lacking of population densities, distribution, and limiting factors of protected and rare and endangered plant species along the proposed transmission route, and the exact on-the-ground location of roads, towers, et cetera, are not known."

Response: BYU has prepared detailed information on the vegetation of the Kaiparowits Plateau which has been gathered over the past 5 years. This information is not published, but is available in the form of annual and quarterly reports. These threatened and endangered species data have been added and referenced in the Final EIS.

There has not yet been a detailed survey or list made of the endangered and threatened species along the transmission systems, road right-of-ways, etc.

Chapter IV contains mitigating measures which require a detailed vegetative study be conducted by the participants to map endangered and threatened plant species along the proposed transmission line, prior to beginning construction. We recognize that data is lacking, but the information is not yet available.

3. Comment: First, I feel we should not build it but we should at least study to know what we are getting into because I feel we should study this area more; that this should be in the final environmental impact statement.

Response: We agree that it would be highly desirable to have more knowledge of the many species of plants and animals within the affected project area. A number of studies are currently underway by Brigham Young University, Northern Arizona University, and The National Science Foundation which, when completed, will provide more information. The Final EIS, however, was prepared before this new information became available. Even if much more information were available on existing plants and animals, many questions would remain regarding project impacts because a project of this type and magnitude has never operated in this area.

4. Comment: The final thing which I'd like to see in the Kaiparowits final statement concerns this question. What will the net energy gain be from the project? Three thousand megawatts it is supposed to produce, but will more

energy go into the building of the plant, the maintenance of the plant? Coal is a very poor producer of electricity and it's very inadequate.

Response: A discussion on net energy analysis was added to Chapter VI of the Final Statement.

J. McComb - Salt Lake City, Utah

1. Comment: And I'd also like to note that in Volume 8, Page 368 and 369 of the Draft Environmental Statement, they note participating utilities will still have equal reserve margins if there were a delay of even two or three years while this regional planning takes place. And that projection assumes the high load growth rate used by the utilities, are indeed come to pass. We believe those projections are far too high.

Response: New power demand projections based upon an independent study have been added to Chapter I of the Final EIS.

2. Comment: In short, the EIS does not consider in detail any alternative location which would avoid the nationally significant recreational source of Southern Utah. The Draft Environmental Impact Statement should be extended to cover several alternative locations well removed from the present focus and meet the level of the detail which the Nipple Bench site received.

Response: The discussion on alternative sites outside Utah has been expanded in Chapter VIII of the FES. Alternate sites in Utah were not considered due to potential legal problems with regard to trans-basin diversion of water and the possible conflict of slurring or transporting coal through or near various national parks in Utah such as Capitol Reef, Canyonlands and Zion, as well as the Glen Canyon National Recreation Area and the Dixie and Fishlake National Forest.

M. Williams - Salt Lake City, Utah

1. Comment: One area in which the Impact Statement is deficient is that of visibility; it appears that the model used to estimate visibility effects is based upon calculated ground level concentrations. This procedure ignores the fact that a brown plume may obscure portions of the sky without significant concentrations of particulates at ground level. During our experiment at Lake Powell, we have found a brown plume which has deepened as the second unit at Navaho went on line. We believe the plume is primarily nitrogen oxide and we expect that the emissions of the Kaiparowits plant will produce a plume about four times as dense as that we observed when the first unit at Navajo began operations.

This plume would be seen as a brown streak across the blue sky during the morning hours of most days. Either of the proposed sites will probably occasionally leave the plume hanging over the scenic Escalante country. Once one leaves the effects of nitrogen dioxide one enters into an area of much greater uncertainty.

Response: Dr. Williams reviewed the Draft Statement and supplemented his oral testimony with written review and comments. His review included additional data being generated by the Lake Powell Research Project in connection with the Navajo power plant. Data from Dr. Williams' review were included in the Final Statement. A portion of the included data concerned visibility impacts and brown discoloration from nitrogen oxide emissions.

2. Comment: The first question is: What are the emissions? The Impact Statement assumes that at all times the design efficiency of the sulfur oxide collectors and the particulate collectors will be met. The experience with sulfur oxide control equipment is somewhat limited and is difficult to assess the validity of this assumption in this case. However, for particulate collectors, there has been some experience which one can be used.

For example, the enclosed list of precipitators describes 15 units and their design efficiency together with present estimated actual performance in the TVA system. Only two of the 15 are meeting design and in one case, approximately 20 tons times as much material is being released as would be expected from the design. In the southwest, the precipitators of the Four Corners power plant and the Navajo plant have failed to meet design on many occasions.

On theoretical grounds, the actual efficiency is going to be sensitive to a number of factors related to the fuel characteristics and the design features incorporated. An author of a recent article describes two units both designed for 99.85 per cent. One would operate at 99.8 per cent and the other at 98.3 per cent. The latter would release approximately 10 times as much material.

Another factor which further complicates the analysis is that frequently control equipment is not used during start-up periods which may take several hours. On these occasions, a dense cloud of brown or gray smoke spreads across the countryside.

Response: See our response to Williams, Comment No. 1. Additional data on emission collection efficiency and reliability have been added to the Final Statement.

3. Comment: The uncertainties in the emission rates make any predictions of contaminate concentrations difficult. However, I shall proceed as though the design values are accurate so that at least some measure of what can be expected during the conditions will be available.

The major question concerns the interaction of smoke plumes with high terrain. Recently, experiments were conducted in the vicinity of the Navajo plant which addressed this problem. They indicate that tracer experiments using fluorescent dye tracers over limited periods of time give very misleading results. For example, a tracer study near Navajo indicated that the maximum expected SO₂

concentrations would be about 0.02 parts per million for three-hour average period. The study conducted after the plant began operation with SO_2 instead of a dye tracer gives a value of 0.3 parts per million for the same conditions. Thus, tracer studies similar to those used at Kaiparowits were in error by a factor of 15. The use of this method to choose among different models probably implies that the model chosen is a poor one.

The model chosen in this case is the Intercomp model which assumes a highly unrealistic idealized atmosphere. The model atmosphere would not be expected to predict accurately for those situations in which high concentrations have been found to occur on high terrain, either in the Navajo case or the case which was Trail, British Columbia. The experience at Navajo can be represented by a NOAA model without ground reflection and two meter per second winds during slight stable conditions. The model gives concentrations over 10 times those predicted by the Intercomp model for high terrain situations. My calculations suggest that particulate concentrations on high terrain might exceed the 24-hour average permitted by the Class 2 increments.

Response: See our response to Williams, Comment No. 1. Additional data on dispersion predictions using other diffusion models have been added to the Final Statement.

4. Comment: Another area in which the EIS is inadequate is the treatment of ozone production for power plants. Studies near a much smaller power plant in the East produced the following conclusions:

- (1) Initially power plant plumes consume ozone and produce a depleted plume, and
- (2) At distances of 40 kilometers the plume becomes a net producer of ozone.

The authors of the study stated, "Observed increases of 20 to 40 parts per billion downwind from the plant stack indicate that air quality standards for ozone are probably exceeded regularly during the summertime operation of huge power plants." We have done some limited studies near the Navajo plant which confirmed the initial depletion of ozone. We hope to be able to look for ozone production in plumes during the next few months.

There are three factors which might make the production of ozone even more likely in this case. They are: (1) Non-methane hydrocarbons released by plants, (2) high hydrocarbon emissions during start up of units, and (3) hydrocarbon levels produced by poor combustion of coal during natural coal fires. In the case of the first of these, investigators with oil shale companies have associated high levels of non-methane hydrocarbons with sagebrush in Colorado. With respect to the second, we have measured high levels of ethylene and other reactive hydrocarbons at Navajo after a unit was just brought online. Finally, the EIS reports coal fires which would also be expected to produce hydrocarbons.

Response: See response to Williams' Comment No. 1. Also, see response to Spence's Comment No. 4.

5. Comment: A major question is that of cumulative effects. Our tracking of the Navajo plume has led us over Fourmile or Nipple Bench on occasion. The concentrations from the Kaiparowits plant in addition to those expected from Navajo might produce levels beyond Arizona standards. Furthermore, much higher concentrations would occur in the neighborhood of Fourmile or Nipple Bench sites than are reported in the Impact Statement. Current plans do not include sulfur scrubbers for the Navajo plant.

Cumulative impacts on visibility can also be expected. These impacts will occur in three ways: (1) The presence of both plants will greatly increase the frequency with which areas such as Grand Canyon National Park, Glen Canyon

Recreational Area, and Bryce Canyon National Park will be affected, and (2) the plumes will sometimes add contaminants to the same volume of air, and (3) the odds of one unit or another being in start up will be greatly increased with the result that photochemical rates will be accelerated. If gasification plants are added they could further aggravate the effects of the power plants because of their hydrocarbon emissions.

The importance of these effects can be illustrated by a few simple examples. The fly ash emissions from Kaiparowits at design levels would be about 12 tons per day with wind speeds of two meters per second and air mixed over six thousand feet vertically to micrograms could be added across a pollution front 17.5 kilometers. If we assume that most of the NO_x converts to nitrate, the winds of the pollution front can extend to 400 kilometers and still average 2 micrograms per cubic meter can mean a 24 per cent reduction in visibility. This simple calculation suggests that even when the air is well mixed significant visibility reduction can be expected over large areas if any significant quantity of NO_x converts to nitrates. Our experiments indicate that nitrates are produced in the Navajo plume. With Navajo and other sources contributing the effect is much worse.

There is one area in which nitrates and sulfates have been found to be very important. That is the Los Angeles Basin where nitrates and sulfates have been shown to contribute 60 per cent of the light scattering. Including both plants one does not find emissions of nitrogen oxides and sulfur oxides as high as Los Angeles; however, the comparison is not as favorable as one might like. The Los Angeles Basin including Riverside, Los Angeles, and San Bernardino has 440 tons of SO_x per day while the Lake Powell Basin has 234 - 53 per cent of the Los Angeles Basin emissions. The Los Angeles Basin has 1,480 versus 446 of NO_x emissions, so that Lake Powell has emissions of 30 per cent of the Los Angeles

NO_x emissions. After other factors are dramatically different, the visibility effects at Lake Powell may not be 30 per cent of those at Los Angeles but even a small portion of the 30 per cent could dramatically alter the character of the area. It would appear to be very important to address this kind of impact in detail.

Response: See our response to Williams' Comment No. 1. Additional discussion of potential impacts from Navajo and Kaiparowits interaction is included in Chapter VI of the Final Statement.

J. Coles - Salt Lake City, Utah

1. Comment: Considering the material currently published in the daily media, the Draft Environmental Impact Statement is clearly deficient in its almost total failure to consider, in any meaningful way, the many alternatives to building the plant in question. Now, when I talked about alternatives, I'm not talking about the choice between the Nipple Bench and the Fourmile Bench sites. Comparing those two sites is rather like comparing the advantages of being kicked in the shins with the pleasures of being kicked in the backside. Rather I am talking about a genuine attempt to consider how energy needs in the Arizona and Southern California load areas can be satisfactorily met.

Response: The alternatives section of the Final Environmental Statement (FES) has been expanded. Even though the discussion in the EIS may be limited, more complete discussions are found in references cited in Chapter VIII of the Final Statement.

2. Comment: I'd like to point out parenthetically that the projected needs of that level has not clearly been demonstrated and that new figures on growth rate and increased rates seem to be indicating that the growth is going to be about half that mentioned in the EIS.

Response: The discussion of power demand projections and growth rates has been expanded in Chapter I of the FES. See response to McComb, Comment No. 1 (Salt Lake City hearing).

3. Comment: Analyses of this kind, focusing on the feasibility of different combinations of technology should certainly be a part of the final Environmental Impact Statement that we are talking about here today. And certainly there should also be included a comparison of the environmental impacts of the various alternative packages of technology, if you will.

Response: See response for previous Comment No. 1.

4. Comment: Government, on the other hand, is definitely in the business of meeting needs, and at this point in history, government probably the greatest responsibility for developing and evaluating comprehensive programs for meeting energy needs. This obligation has not been met in the Draft Environmental Impact Statement, as it should be. The alternatives should be reconsidered, analyzed, and expanded. The way the statement reads right now when one often gets the impression that government, like the utilities, is in the business of selling power rather than meeting real needs.

Response: Many of the mixes mentioned in the references cited in Chapter VIII will require the establishment of a governmental energy policy, probably on a national level. Even after the establishment of such a policy, the implementation of it will require several years, particularly in achieving energy conservation measures and technological mixes requiring replacement of present structures and facilities. Thus, even with the immediate establishment of many of these alternatives, additional generating capacity is needed for the interim period. The discussion on energy conservation has been expanded in Chapter VIII of the FES.

5. Comment: In any case, it is certainly the obligation of this Environmental Impact Statement to provide understandable and comprehensive pictures of the

likely effects on the proposed project on family structure as well as community and other kinds of social structure and to spell out how these changes will impact such things as personal adjustment, which I do think was covered to some extent, marriage patterns, customs and moral standards, and so on.

Response: The text of the Socioeconomic Sections for Chapters III and V have been revised to discuss the above ideas regarding stress, the family structure, and the extended family.

R. Rudolph - Salt Lake City, Utah

1. Comment: The ones most affected would be the most valued carnivorous game fish of the lake. The Impact Statement states that fishes prized by the angler are the ones most likely to accumulate mercury levels that would render them unsafe for human consumption. These would be such fish as the large-mouth bass, the wall-eyed, and trout. And they would be becoming inedible and lost as a valuable resource to fishing interests at the lake and of the area, and to the nation. This impact would not be in keeping with the legislation which created Glen Canyon National Recreation Area which Lake Powell is a part.

Response: The purpose of an environmental statement is to assess impacts to the environment that would result from a proposed action, and provide data to the decision-maker allowing him to reach a conclusion as to whether the proposed action with resultant impacts is acceptable or consistent with the intent of existing legislation.

2. Comment: Alternatives for siting the plant in Utah except for the Kaiparowits Plateau area were not discussed at all. Alternative means of meeting the service areas, electrical demands were developed in a cursory manner. There is no way to evaluate the relative environmental merits of each alternative. Nowhere in EIS is there an adequate description of alternative water uses.

There was no discussion of what water alternatives would bring the greatest net benefit to the public. The alternative of selling Utah's water to the users in the Lower Basin states was not even mentioned.

Response: The section on alternatives, including alternative uses of water, has been expanded in the Final Statement.

Most of the alternatives discussed fell short on technical feasibility or state of development; these were dropped without more than cursory discussion of larger environmental impacts. Where the alternative appeared to be viable and reasonable, as, for example, siting the plant on Nipple Bench and transmission line alternatives, impacts on the environment were considered.

The best use of water was not addressed in the Kaiparowits statement since this determination is the prerogative of the Utah State Engineer. Also, see response to McComb, Comment No. 2 (Salt Lake City hearing), concerning alternative plant sites.

3. Comment: Besides not adequately considering impacts associated with the project, the Impact Statement has left out many aspects of the project development and the environmental consequences of that development up to the imagination of the reader. The most glaring deficiency in this regard is the development of a new town. Where will the new town get its money it needs for community services such as fire protection? Will the funds be found for other services needed but not covered by Utah's recently enacted energy development act? What are the potential consequences that the project will have on existing property taxes in Kane and Garfield Counties?

Response: Data in Chapters I and III of the DES cover these concerns. Potential consequences on existing Kane and Garfield county taxes are not known, but an increase in general taxes would be very likely, if previous studies of similar social change projects are considered. Refer to Chapter III, Socioeconomic section.

4. Comment: According to the EIS and I quote, "no significant effects on regional climate could be expected if the proposed action were implemented." The National Oceanic and Atmospheric Administration is currently conducting studies in the Four Corners area and up around the coal strip in Montana in order to gain necessary information with which to determine the effects of large-scale coal development on regional climate. No spokesman has said and I quote, "It is reasonable to assume that there is as yet insufficient data to assess the long-term meteorological consequences of coal development." It is my hope that this discrepancy be addressed in the final EIS.

Response: The current literature indicates mixed opinion regarding the potential for solar energy resource degradation and climatic change associated with coal-fired power plant development. The BLM is not aware of substantial evidence of significant regional changes resulting from a project of the scale proposed. As indicated in the impact statement, the Navajo power plant has the potential of interacting with the proposed power plant under certain meteorological conditions. The effect is not expected to be of sufficient magnitude or duration to influence regional climate.

5. Comment: The information presented by the utilities in the Impact Statement leaves many questions unanswered. For instance, what factors account for the differences in the annual per capita energy consumption in different service areas. Arizona Public Service predicts by 1985, its per capita consumption will be 20,023 kilowatt hours. San Diego Gas and Electric predicts that by 1985, the per capita energy consumption will be only 9554 kilowatt hours. That is a discrepancy of over half. Arizona Public Service is saying that consumers consume over twice the kilowatt hours of Southern San Diego Gas and Electric. There is no discussion of that discrepancy or the factor that accounts for in the Impact Statement.

Response: Refer to responses to McComb, Comment No. 1 (Salt Lake City hearing), and Coles Comment No. 2 in the Hearings section.

6. Comment: There is also insufficient discussion in the Impact Statement of why utilities believe that the energy consumption will increase along historic growth rates.

Response: This section of Chapter I has been revised to include adjusted companies power demand forecasts, FEA verification, and one independent demand forecast. The EIS further discusses the need for the proposed action even if the power demand decreases.

7. Comment: Perhaps the most important omission in the EIS, the paramount consideration of the entire proposal is the relationship that this project has to other energy development in the region.

Response: Section 102(2)(C) of the National Environmental Policy Act (NEPA) provides that federal agencies shall include "in every recommendation or report on proposals for legislation and other major federal actions" significantly affecting the quality of human environment, a detailed statement concerning the effects of and alternatives to that proposal. The Supreme Court has held that "the time at which the agency must prepare a final 'statement' is the time at which it makes a recommendation or report on a proposal for Federal action." (Aberdeen & Rockfish R. R. v. SCRAP No. 73-1966 decided June 25, 1975, Slip Op. 26, (SCRAP II).) SCRAP II tells us that no impact statement is necessary until the government makes a recommendation or report on those private proposals. In the case under discussion, the Department of Interior is in the process of preparing an impact statement with respect to those proposals involved in the Kaiparowits project.

The government has petitioned the Supreme Court of the United States for a writ of certiorari to review the judgment of the U.S. Circuit Court of

Appeals for the District of Columbia in the Sierra Club, supra. This procedural step was taken because we believe the issues involved in the government's petition are of great importance. The philosophy of the Department of the Interior in this petition is entirely consistent with its interpretation of its role under NEPA. Any alternative course of action at this stage would, we believe, be at the expense of the welfare and security of this nation. We do not believe it expedient to suspend the development of this nation's energy resources for several years more in a particular area while the government prepares a "regional" impact statement as the price of continued "contemplation." Our reasoning in our defense in the Sierra case, supra, controls our position in the matter of the Kaiparowits project.

F. Crall - Salt Lake City, Utah

1. Comment: What will be the long-term effect of the air pollution upon the vegetation and wildlife including the fish of Lake Powell? Are there no data available on the effects of such pollution? Are we to wait 20 or 35 years to find out what happens?

Response: Discussion of long-term effects of trace elements and low levels of other emissions on wildlife and habitat has been expanded in Chapter III, Wildlife, Kaiparowits Plateau Impact Area. Unfortunately, it will probably be a number of years before all long-term effects are definitely known.

Additional discussion of potential impacts of mercury on the Lake Powell ecosystem has been included in the Final Statement. Fluorine emissions have also been discussed further. Other trace elements are not expected to have significant impacts in the short term. As indicated in the impact statement, pathways of many of these elements through ecosystems are not well defined and it is difficult to realistically predict long-term, subtle impacts. Although no vegetation or animal injury would be expected at the levels predicted,

environmental monitoring for accumulation of these elements would better define the environmental risks of long-term, low-level input.

2. Comment: What is the scientific significant value of the pinyon-juniper forest that would be destroyed at the plant site? Are there other areas such as this for study with trees over a thousand years old?

Response: Additional information has been included in the Final Statement concerning the potential significance of the Fourmile Bench pinyon-juniper community. Because the community has been identified as a permanent or climax community it is a potential source of unique scientific information. One tree in excess of 1,000 years of age has been identified and it is assumed that others exist within the area. It has not been established if trees of similar age exist on other locations in the Kaiparowits area.

3. Comment: How much percolation of elements will occur in the settling and evaporation ponds? Are these in actual recharge areas for ground water, and if so, where will the contaminated water emerge?

Response: Fourmile Bench is in an area of natural ground-water recharge. It is estimated in the Water Resources section of Chapter III that about 22 acre feet per year would seep from the evaporation ponds. Any seepage would probably emerge in nearby canyons. The impact on water quality cannot be quantified, but the potential impacts are addressed qualitatively in the Water Resources sections of Chapters III and V.

4. Comment: What allocations are planned by the United States Forest Service, the Bureau of Land Management, the Federal Fish and Wildlife Service, and the State Division of Wildlife Resources for management of the lands opened up by roads adjacent to the plant and transmission lines?

Response: The reference to allocations is not clear. Assuming that allocations mean monies, then we do not know at this time what budgetary plans these agencies have made for the management of adjacent lands.

5. Comment: What will be done to detour poaching which is presently the greatest threat to wildlife in the area? What will be done to protect the endangered species from collectors and destruction? What plans are being proposed for the increased recreational use of the land - including hunting, fishing, off-road vehicles and backpacking? What proposals are made for protecting the raptors that perch on transmission lines from indiscriminate shooting? How can any of these agencies manage the lands if roads to transmission lines are maintained or left open?

Response: Poaching is identified as an impact in Chapter III, Recreation Resources and Wildlife. Plans for controlling poaching and other recreation use will be developed after the project is approved (if it is approved). Hopefully, the development and implementation of these plans would be timely and adequate to minimize the damage due to poaching and other forms of visitor use. These problems are discussed in Chapter V of the Final EIS.

6. Comment: What will the impact on these mule deer that use the Kaiparowits Plateau for spring and winter grazing, on the elk of Johns Canyon, on the sage grouse and other game birds?

Response: On page 7, of the Summary section of Chapter III of the Draft EIS it is stated that habitat for about 30 deer year round or 90 deer seasonally would be lost. These impacts were discussed in Chapter III.

Impacts on elk, sage grouse, and other wildlife of the proposed Johns Valley Limestone quarry site were described on page 174 and in figure No. 36, Chapter III of the Draft EIS.

7. Comment: Specifically, what will be done to identify endangered species habitats and breeding grounds along the transmission lines? Although we have a complex checklist of all the living things from Kaiparowits to San Bernardino, we have no assurance that habitat for species like the endangered peregrine falcon or southern bald eagle will be identified and preserved.

Response: Mitigating measures, as described in Chapter IV, would require an inventory of the habitat in question prior to construction. When the actual alignment is located on the ground, a biologist would accompany the survey team to insure that the habitat mentioned would be avoided where possible.

8. Comment: What is going to be done to prevent raptor electrocution on temporary and small power lines such as those going to the pumping station on Lake Powell? A publication Suggested Practices for Raptor Protection on Power Lines published by the Raptor Research Foundation, Incorporated, and the Edison Electric Institute spells out construction on such lines to prevent electrocution. Nowhere in the statement do I see reference to this kind of construction.

Response: Should the project be built, BLM right-of-way agreements would include stipulations for minimizing the electrocution hazard to raptors.

9. Comment: How will dust abatement be handled in the limestone quarry? Where will water be obtained and how will this affect present aquifers needed by game animals? Why aren't the companies proposing to surface roads such as the one from the quarries to the stockpiles?

Response: These items are discussed and analyzed in Chapters III and V. We do not know why the participants have not proposed to surface these roads.

10. Comment: What areas have been identified as areas where subsidence due to mining can occur? What were the criteria used for determining such areas? I

guess I was concerned about this because I went to - I went to school in a mining town and one day our schoolground caved in. What areas have been identified as areas - what efforts are being made to avoid visual impact of communication facilities?

Response: Subsidence and prevention of subsidence were addressed in the Draft EIS in Chapter III. Areas of shallow overburden (canyon bottoms and sides) would be protected by leaving at least 50 percent of the coal in place for support. Where greater extraction is practiced the overburden would be at least 300 feet or more and the resultant subsidence is expected to be uniform. No man-made structures are now present or contemplated over subsidence areas.

11. Comment: What type of vegetation is planned for dumps and disturbed areas? In a regions where the annual rainfall is between six and twelve inches per area, where topsoil is minimal, where germination of seeds at best occurs two or three years out of ten? Where many areas will have high temperatures due to smouldering and burning wastes? Vegetation along previous transmission lines has not recovered. Is there, in fact, any realistic way of revegetating such areas?

Response: The probability of seeding success as discussed in Chapters III and IV of the Draft and Final Statement is based on the establishment of the most adaptable vegetation under natural conditions. This is why such statements as less than 3 years out of 10 years and 3 to 5 years out of 10 years are used for stating the probability of seeding success. There is no realistic method of improving on this probability since revegetation would have to be carried out in perpetuity. If such efforts are discontinued, there is a strong possibility of vegetative die-off.

12. Comment: What assurance do we have that the unemployed of Kane and Garfield counties will not remain unemployed if such a plant were built? Will not the

skilled laborers be union people from California and Arizona as well as the trained technicians? Is the real issue unemployment or is it merely a political toy?

Response: Because of the employment needs of the power plant, administrative services, potential union involvement, and the labor force influx, it is reasonable to assume that unemployment among existing Kane and Garfield county residents would not be substantially altered for an extended period of time. This is discussed in Chapter III, Socioeconomic section.

13. Comment: What will be the accumulative impact of this project over the next 35 years? Is that not the purpose of this EIS - to identify the impacts? Is the collation of all available data on this region to be construed as an evaluation of the impact?

Response: The impacts are discussed in Chapters III, V and VI.

D. Weins - Salt Lake City, Utah

1. Comment: Except for the areas surrounding the actual development site for the vegetation would be destroyed or badly altered, all the report is able to tell us is that there would be impact on the vegetation to varying degrees within a hundred miles of the plant itself. I see no mention of endangered plant species in the area around the Kaiparowits Plateau, although this is mentioned for the transmission corridors through Arizona and California. There are 163 Utah plants currently classified as endangered or threatened.

Response: See our response to Beard, Comment No. 2.

2. Comment: Furthermore, this statement does not tell us what plants are in the area except for the common species. How are we to know what impact the Kaiparowits project might have on the biota if we do not even have a complete inventory. Surely there must be several hundred plant species in the area.

Response: See our response to Beard, Comment No. 2.

3. Comment: The same is true for other organisms. For example, there are certainly several thousand species of insects yet to be discovered on the Colorado Plateau. Without complete inventories of the biota in areas being considered for major industrial expansion, we are certain to extirpate species without even knowing they existed. Who is to say what potential usefulness such organisms may have for man? I would strongly urge that environmental studies of the magnitude and importance of this project be given an independent academic review prior to release. This suggestion has been proposed to the National Academy of Sciences.

Response: See our response to Beard, Comment No. 2.

P. Cox - Salt Lake City, Utah

Comment: Perhaps one of the least explored yet most hazardous aspects of plant influence will be radioactive elements. Apparently the coal to be burned will have a low grade of activity. According to Page 818 of the Energy Study, .0053 curies per day of uranium 238 and radium 226 will be released into the atmosphere. Assuming these heavier elements fell to the ground within a 50-kilometer radius of the power plant over a 30-year period, the concentration of these elements, assuming that they will be concentrated in the upper one meter of the soil, will be 7.839 curies per cubic centimeter. The maximum allowed level of exposure to uranium 238 as expounded by the International Atomic Energy Commission is found on Page 48 of Basic Safety Standards for Radiation Protection. It is three times ten to the negative twelve curies per cubic centimeter. Assuming then equal distribution of these elements after 30 years the concentration of U 238 will be fifteen-hundredths of the maximum allowable concentration for humans in the 100 kilometer-diameter circle. This is especially

significant when one realizes the impact this will have on the agricultural and ranching concerns of the area.

As insoluble forms of these isotopes tend to build up and leave tissue, thus significant levels of these radioactive materials may be found in tissue and the patrons should be very concerned. If all of these radioactive elements fall to the ground within a 2.2 kilometer radius of the power plant, after 30 years the concentrations will exceed the maximum allowable standards set by the International Atomic Energy Agency for human habitation. Because of prevailing winds, a portion of these effluents will be pocketed and concentrated in various canyons and possibly, according to Page 820 of the Federal Task Force Study, will become trapped in the Grand Canyon.

According to the Federal Task Report, .145 curies per day of radium 228 and other elements will be emitted into the atmosphere. Over a 30-year period, these elements settling into the top meter of the ground within a 50-mile radius of the power plant concentrations of 2.02 times ten to the negative fourteenth curies per cubic centimeter. The maximum allowable standard by the International Atomic Energy Agency for these elements is three times ten to the negative thirteenth curies per cubic centimeter which places the Kaiparowits effluents at about six per cent of maximum allowable concentrations after 30 years.

It should be remembered, however, that pocketed concentrations of these effluents in canyons and biological ramifications into actions may bring significant concentration of these elements into the tissues of animals at the top of the food pyramid, such as eagles and mountain lions and, as I indicated previously, taken as a very serious agricultural and ranching concern. Because much of the area is of a slick rock constitution, considerable concentrations will also be found in the waters of Lake Powell. These radioactive elements will remain long after the 30-year life expectancy of the power plant. They

will remain long after all; our legacy to future generations, our gift to our children's children. Long after the last boom town cafe boards up its windows, there will remain, possibly in hazardous concentrations, these elements.

Response: The estimated release of radioactivity from the Kaiparowits power plant, based on the coal analysis of Ra-226, Ra-228, Th-230 and Th-232 would be approximately 0.0000744 curies per day (Ci/d) with 99.5 percent control of particulate emissions or 0.00015 Ci/d with 99 percent control. Using the higher value, this amounts to 1.63 curies of radioactivity released over a 30 year period. If the assumption is made that all of this radioactivity would be deposited within a 50 kilometer (km) radius and the entire amount remains within the top cubic centimeter of soil, the resulting concentration would be approximately 2×10^{-14} curies per cubic centimeter or .02 picocuries (pCi) per cubic centimeter. The average concentration of Ra-226, Ra-228, and Th-232 in Utah soils is approximately 1 pCi per gram. Assuming the same concentration for Th-230 this would amount to 4 pCi per gram or approximately 2.28 pCi per cubic centimeter assuming an average bulk density of soils of 1.75. With the assumptions indicated, the estimated addition of radioactivity from uranium, thorium and daughter products from the Kaiparowits plant over a 30 year period with only 99 percent emission control would be about 1 percent of that now present in the soils. Because the nuclides discussed have not been identified as being concentrated up the food chain, it is not expected that this level of addition to the ecosystem would be reflected in significant or even measurable increases in animals up the food pyramid.

S. Janke - Salt Lake City, Utah

1. Comment: Pages 1-18 and following and the curving in Volume 5 indicate no slacking in the projected peak demand or in the per capita use of electric energy. The question should then be raised: Does the EIS deal with first a

possible increase of plant size up to that projected in the Southwest Energy Study which is to say 8,000 megawatts and second, does it consider the cumulative effects of all power plants projected for the southwest and especially Utah - Utah Power & Light's projected plant on the Escalante, Intermountain Power Project in Werner Valley and so forth. Apparently the EIS does not, at least not in any depth.

Response: Chapter VIII discusses the possibility of a 6,000 MW plant. The Final Statement considers the accumulative air quality effects with the Navajo power plant at Page, Arizona. The Escalante, Intermountain Power plant and the Allen-Warner Valley plant are not included for the same reasons cited in our response to Rudolph's Comment No. 7 in the Hearings section. Also, refer to the discussion on interrelations in Chapter I of the FES.

2. Comment: Now to go back to the original question: What happens after 1985, the cutoff date on all the graphs I just referred to? If we continue to try to meet this projected demand by installing more capacity, what will be the effects then on even more generating units to be built to come on-line after 1985, and again does the EIS speak to that point?

Response: This would require a regional energy study to determine our future demands. However, the scope of the Kaiparowits EIS was limited to a discussion of the Arizona and southern California market demands only. Refer to our response to Rudolph, Comment No. 7.

3. Comment: "... At this particular junction the EIS strikes us as being inadequate inasmuch as only a few pages are devoted in Chapter 8 to anything other than alternative transmission line routings. Specifically if the decision is made that the objective - that is the objective of generating 3,000 megawatts - is indeed desirable then in Chapter 8 there are a few one-sentence statements that nuclear, geothermal, and solar alternatives are not feasible. Not that we

are supporting any of these, because we do not feel that the overall objectives should be supported, but the point is there is no documentation or any backup to any of these blanket statements. We would like to see this deficiency in the EIS made up. Likewise there is no adequate treatment, let alone specific indication, of 'advanced generation and transmission systems.' This is Page 9, Chapter 8. . . .

Response: The sections on alternative sources of energy have been expanded in the Final Statement.

4. Comment: ". . . (Therefore, we urge the most serious consideration of conservation measures in the final draft of the EIS as an alternative to the plant.)

Response: See response to Coles, Comment No. 4.

5. Comment: (Now if it is still decided that additional fossil fuel generating capacity is desirable, then consideration ought to be given to - again, without any presumption of support on my part - to the following: the shipping of coal mined on the Kaiparowits Plateau to the load centers or at least closer to the load centers for loading there.)

Response: The State of California does not permit the use of coal for burning in power generation plants, except in the southern desert which is not near the load center.

6. Comment: "Another alternative which ought to be addressed is the gasification of coal both where the mining and gasification take place in the Kaiparowits. . ."

Response: The alternative uses of coal have been expanded in Chapter VIII of the FES.

7. Comment: However, for these questions, which we hope to investigate to some degree ourselves, what tonnage and volume of solid waste material would be

developed daily or yearly by the plant; that is, from the combination of limestone, waste and fly ash?

Response: A "Quantities-Summation" sheet was included on page I-13 of the Draft EIS which gave these quantities. They all appeared within the text under their appropriate headings. This same information will be included in the Final EIS.

J. Viavant - Salt Lake City, Utah

1. Comment: The region where the proposed Kaiparowits plant would be built is in one of the cleanest air regions of the whole United States. Our clean air is a precious resource and its uniqueness makes it even more precious. I would like to see the Environmental Impact Statement attempt to address the issue with a great deal more honesty. There doubtless is insufficient data to completely assess the impact but to pretend that there may be or may not be accumulative effects is simply evading the issue.

Response: Additional data, which make it possible to better evaluate the potential impact and influence of the Navajo plant on the air quality in the Kaiparowits impact area, have recently become available and have been added to the Final Statement. These include additional data from the Lake Powell Research Project (Dr. M. Williams); review comments and additional data provided by the Arizona Department of Health Services, Air Quality Section; Navajo Generating Station Sulfur Dioxide Field Monitoring Program; Dames and Moore Meteorological and Air Quality Studies of Navajo - 1974; Dames and Moore Meteorological Data for Nipple and Fourmile Bench - 1974; and North American Weather Consultants Meteorology and Stability Study - 1975. These data have been used in the discussion of the potential additive impacts of Navajo and Kaiparowits. Chapter VI states further that based on the conclusions of the Joint Meteorological Report (1971)

and the Meteorological Group of the Southwest Energy Study (1972) considering the separation distance, relationship of plant sites to prevailing winds, large atmospheric dilution potentials, interposing terrain features and types of emission controls proposed, the probability of interaction of emissions between the four additional proposed coal-fired power plants and two coal gasification plants appears small. However, there is presently insufficient background information to fully evaluate potential long-term and cumulative effects of the present development scenario on air resources, visibility and elemental buildup through long range transport to areas of higher accumulation.

2. Comment: The other effect that I felt was inadequately dealt with was the long-term socioeconomic effect. In Volume 5 on Page 354 there is a table listing the water that would be used from the Colorado River. In 1980 the Kaiparowits plant is estimated to use 12,000 acre-feet; in 1990, 102,000 acre-feet; in the year 2000, 102,000 acre-feet; in the year 2030, zero acre-feet. The implication is that the Kaiparowits power plant will no longer be operating. Therefore, I feel that the socioeconomic impact should definitely deal with what happens to a brand new town of 15,000 people when suddenly there are no jobs for any of them.

Response: The text of Chapters III and V, Socioeconomic Sections has been revised to include a discussion on long-term socioeconomic effects.

G. Swensen - Salt Lake City, Utah

1. Comment: In the section on socioeconomic impacts in Chapter 3 several pages were devoted a public opinion poll which didn't sit too well with me for several reasons. The claim was made on Page 289 and I quote, "That a strong distaste for federal control of energy development and environmental protection

was revealed in the public polling." Now if one looked at the question to which that apparently referred, which is the one shown at Figure 392, and adds up the different categories one finds that the categories indicating either support for present controls or advocating stronger controls total 45 percent whereas categories including distaste only total 10 per cent and the rest undecided. Now that is more than 4.5 to 1 and I think if this poll is valid it should at least be summarized accurately.

Response: The text has been revised. The public opinion study referred to is subject to concerns such as you have expressed. The public opinion study, which is now included in the reference material binding, should be interpreted in terms of its general findings and the fact that opinions vary with time and additional information. It is not known, on the basis of that study, if residents are concerned about losing political power. However, such a condition could occur. Similarly, there is no known documentary information regarding whether or not the residents of Kanab feel the new town is too close to their town. Refer to Chapter III, Socioeconomic section, particularly the subsection on the Kaiparowits Plateau impact area.

2. Comment: I think at least equal time should be given to that possibility in the calculations and perhaps to the same set of calculations on those assumptions and see what effects it will have if particulate removal is increased by 600 percent. I don't think there is an economic incentives for the consortium to do any better because why should you spend money to repair your facilities unless there is any legal reason to do so. So I wonder if there is any way that before this is approved or any connection with the water contract, if a guarantee couldn't be reached or shouldn't be reached or required that these design efficiency standards will be met or if the EIS shouldn't be redone to deal with the possibility and I think probability that they won't.

Response: Refer to response to Spence, Comments No. 1 and 3, and Williams, Comment No. 2.

3. Comment: Scattered throughout this statement there were figures which gave bit-at-a-time efficiency of the resource use. Fifty per cent of the coal in the mined area would be mined of which 75 per cent of that recovered would actually reach the plant of which efficiency converting heat from coal into electricity would only be 35 per cent. It might have been mentioned that when multiplied together that works out to 13 percent and you still haven't included the loss of efficiency due to resistance in the power lines, and 13 percent seems to me to be inefficient. That's subjective but it seems wasteful.

Response: The text has been revised in Chapters III and V of the Final Statement. Much of this potential energy contained in coal is not utilized in thermo-electric plants. However, alternatives are addressed in Chapter VIII showing that these technologies are not too efficient, and environmental impacts are equally, if not more severe.

4. Comment: In the section on alternatives - this was already mentioned a moment ago - the Impact Statement says that the use of solar energy to produce 3,000 megawatts is not technically feasible at this time. I think that tends to evade the real issue because I don't think that anyone is advocating a 3,000 megawatt solar power plant. I think perhaps the real point is that smaller units are already becoming feasible and as they become more economical and more efficient we could perhaps expect them to reduce or eliminate the need for this plant or any other 3,000 megawatt plant.

The Impact Statement doesn't discuss the possibility of using small residential storage units such as those or using storage units which would level demand by increasing demand during off hours and reducing demand during

peak periods. Since this plant is ostensibly to be built ostensibly justified by a need to meet peak demands, alternatives which would reduce peak demands should also be discussed.

Response: The discussion of solar energy in the Final EIS has been expanded to make it more clear that feasible mixes of solar energy power sources, small and large, have been examined and that such sources would probably not meet the project objective. Solar power sources, whether directly sun-powered or powered by wind or wave, probably will be a major source of power in the more distant future. Chapter VIII, alternatives contains a discussion of conservation measures which would affect the peak demand.

5. Comment: This has already been mentioned. I think the section on cumulative effects is rather inadequate. I have heard unofficial statements - and I am certainly in no position to know how valid they are - to the effect that perhaps once this is approved, if it's approved, then it will immediately be time to go for three more units. And I tend to think that it wouldn't be at all unreasonable to also, as Mr. Janke said, reduce the water contract to half or make the water contract contingent on the consortium not asking for three more units. Now either way it would not harm the company if in fact they are being forthright, and if in fact they do want three more units then this statement is certainly not complete.

Response: A short discussion was added to the Final Statement to consider the future enlargement of the Kaiparowits plant, from 3,000 MW to 6,000 MW and even to 26,000 MW. The participants have proposed construction of a 3,000 MW plant. We are not aware of any other construction plans. Impact analysis in Chapter III was based upon a 3,000 MW plant.

G. Atwood - Salt Lake City, Utah

1. Comment: In reading it I have been very concerned about the mercury

content of Lake Powell. Certainly that would have a very adverse social impact if indeed it adversely affected game fishing on Lake Powell. I didn't find - and maybe it was just my fault on looking through it - any sort of alternatives that might be used to reduce this particular impact. I gather that it is from air pollution and also from possible erosion of the ash perhaps over time, perhaps the one foot gets eroded and the gaps don't hold and over time all the mercury enters by erosion Lake Powell.

Response: Coal that would fuel the Kaiparowits power plant contains mercury. During combustion of the coal, mercury would be vaporized and an estimated 96 to 98 percent released to the atmosphere. A portion of the mercury would be deposited on the watershed and is predicted to move from the watershed into Lake Powell to augment present levels in various components of the Lake Powell ecosystem. The remaining 2 to 4 percent of mercury contained in the coal would be deposited with the fly ash in the storage area. Additional discussion of the potential impacts has been made in the Final EIS. See also response to Sleight's Comment No. 4.

2. Comment: I just wonder whether underground disposal of the waste has been considered. I didn't see it in the Impact Statement.

Response: This is discussed in Chapter VIII under "Ash and Scrubber Waste Disposal."

Q. Phillips - Salt Lake City, Utah

1. Comment: Particular areas that bother me are: diffusion models. I don't know if you people are interested in diffusion models but the best data that I have to date which was done by a Dr. Lamb in the University of California, Berkeley, in a Ph.D. thesis he was able to attain for the L.A. Valley, which is a particularly easy area to model, a factor of only two in getting accuracy for

diffusion models. Now the research that is done by the EPA and the government to my knowledge has nothing better than this. So we are talking, perhaps as Paul Cox pointed out, 30 years to maybe 50 years before these pollutants are developed to toxic levels or above federal standards.

Response: The text has been revised. The state of the art of diffusion modeling, particularly in complex terrain, as well as model validation has not been developed beyond the point where precision and accuracy beyond a factor of two to three can be expected. For this reason, conservative assumptions are made in an attempt to identify the upper range of expected concentrations. As indicated in the impact statement in Chapter III, there is no universally accepted diffusion model and results from more than a single modeling technique were used for comparison in the statement. Unfortunately, even less is known of the relationship of air concentrations of a pollutant, deposition rates and subsequent movement through ecosystems. Definition of these relationships is needed to make accurate assessments of potential long-term cumulative environmental impacts. See also our response to Williams, Comment No. 3.

2. Comment: Another factor: The removal of particulates from the stack gases fails to remove particles of smaller than one micron. That's really small but the point being that research has indicated that these small particles are forms that are most detrimental to human health, are the ones that travel the furthest and have the greatest effect as far as general pollution is in the area. These are two considerations.

Response: Existing particle collecting devices, including electrostatic precipitators, are more efficient in the removal of particles larger than one micron or less. These particles have been identified as having the greatest effect on human health. Smaller particles also have slower settling rates and therefore

travel further distances. Although the magnitude of particulate pollution threat is subject to controversy, based on predicted emission rates, the resulting ambient air concentration of particulates from Kaiparowits is expected to be below the level presently defined as adequate for protection of human health and welfare. These calculations considered the predicted most-limiting case which would lead to the highest atmosphere concentrations. Under prevailing meteorological conditions and normal operating conditions it is expected that ambient air concentration would be lower than the short-term, worst-case condition. This information is in the FES.

G. Anderson - Salt Lake City, Utah

1. Comment: One of the greatest environmental impacts associated with the proposed Kaiparowits project is the certain degradation of the pristine air quality of this region. The Draft Environmental Impact Statement is curiously deficient on the subject of visibility in the Colorado Plateau region and the cumulative impacts this massive naturalization will have on the air quality of the naturally significant scenic and recreational resources found here. The Draft Environmental Impact Statement repeatedly refers to the design efficiency of the pollution control systems proposed by the participating utilities but makes no reference to the fact that these figures represent efficiencies which cannot be maintained except for short periods of time and under ideal conditions.

Response: The Final Statement discusses the predicted impacts on visibility from the Kaiparowits power plant based on a predictive model study and the assumptions used. The Final Statement also discusses additional data on potential visibility impacts based on data provided by the Lake Powell Research Project from Navajo power plant studies. Additional data have been included on expected emission collector efficiencies and reliability as they relate to Kaiparowits. Additional discussion has been included on proposed emission control and the

control calculated to be required by the most restrictive applicable air quality regulations.

2. Comment: The Draft Environmental Impact Statement is grossly inadequate in many other respects, including an analysis of the questionable power demands for the market areas submitted by the participating utilities and of suitable alternatives to the project such as conservation measures and the increased implementation in the load center areas of our most abundant, clean safe energy source - the sun. These inadequacies underline the fact that this country is faced not with an energy crisis but with a crisis of ingenuity on behalf of the energy companies and the crisis of integrity in the Department of Interior in managing the public lands.

Response: See responses to McComb, Comment No. 1 (Salt Lake City hearing) and Coles, Comment No. 2.

The section on alternatives has been expanded in the Final EIS. See also response to Coles, Comment No. 4.

L. Gordon - Kanab, Utah

1. Comment: I am wondering if we looked at the possibility which I don't think that the Environmental Impact Statement did adequately of what other alternatives we could get without quite so many impacts. There are alternatives. If we were to turn down Kaiparowits today, I suspect that the county commission in Kane County and all of the other public officials of this state and this region would have their hands full trying to cope with the other requests for development in this area.

Response: Chapter VIII of the Final EIS discusses a variety of alternatives.

2. Comment: I hope, that you will use the information that I trust BLM has resulting from the discovery at Roosevelt Hot Springs on geothermal. Your

authors could not at the time of your writing could not have known about it, but I hope the final draft will reflect that there is a substantial geothermal activity in Utah, that it is being developed. I hope you will be able to give us some kind of estimate of potential power generation in terms of megawatts. The information we have indicates that it's three or four times the potential of operating Geyser Field north of San Francisco and, of course, you have the Sulphurdale field that you leased this last summer just over the mountain, what, 15 miles?

Response: Additional text and references have been added to the Geothermal Power section of Chapter VIII. However, we do not have any estimate of the potential power production from the geothermal site being explored near Milford. Indications are that few geothermal sites in the world can sustain the production of power which could be produced by Kaiparowits.

3. Comment: The section delineating the possibility of conservation in the market area as an alternative, I would like to note that the proposal has the endorsement of the Western Governors' Conference. Your own EIS indicates by the turn of the century, nearly \$300,000,000 savings and capital investment money is possible by inference. We believe the electric power to the consumer will be lower if fewer plants were built . . . The EIS dismisses the conservation efforts on the grounds that the utility companies are not prepared to carry out the kind of construction work involved. I would wish that the EIS would show that there are other companies, construction companies, other businesses that would be involved in the conservation efforts that there would be unemployment potential; that would extend to not only Utah, but elsewhere. Therefore, two other alternatives, one which is not mentioned. I believe the Bureau of Land Management has at this time a preliminary request having to do with the railroad right-of-way into the Southern Utah coal fields. If you have that information,

I would prefer that it will be reflected in the Impact Statement so that a choice might be made between burning the coal locally and exporting the coal. Again we would like to see the power potential for total employment mentioned as a part of this impact. A great deal has been made by previous speakers of the effect of employment and economic growth in this part of the state . . .

Response: Discussion of energy conservation alternatives, following the discussion of A Time to Choose, America's Energy Future, published by the Ford Foundation (Freeman, et al., Ballinger Publishing Co., Cambridge, Mass., 1974), has been presented in the Final EIS. The methodology and analyses are presented in the reference. It is doubtful that changes in employment resulting from an energy conservation policy could be estimated with any accuracy short of an economist's input-output table of exhaustive complexity; however, it is possible that changes in employment could be shifts from power production to manufacturing and the service sector, rather than to unemployment, since the shift is expected to take place over 20 years or so. Consideration was given to alternate generating sites outside Utah in Chapter VIII.

4. Comment: I hope that the EIS will take a part of this slap. The basic commodity in Utah as far as the development is concerned has got to be water. This has been previously noted, the Utah correction, the Colorado River is over-allocated by some claims. In any event, requests for water from that source clearly exceed the potential to deliver. This is true not only in Utah but the entire southwest. The question then comes, are we now using the water in the widest possible manner. Now, the Kaiparowits project will use 45,000 acre-feet of swamp cooler to get rid of the waste heat. Our question is can we do better than that? Can we develop southern Utah in a way that will have better use of our water?

Response: The alternative uses of water discussion in Chapter VIII of the Draft EIS has been expanded. The priorities on water usage are established by the Utah State Engineer.

5. Comment: I'll put that in my written comment. I want to ask one final question. I'd appreciate an immediate answer if you can give it. If the Federal Energy Administration wants intermittent control on power plants in rural areas, if Congress approves the bill which was submitted to Congress recently and was acted on negatively last week by Congress and if the bill should subsequently pass, would not the Federal Energy Administration have the authority under their rule-making powers to compel intermittent emission control equipment? If I can't have the answer now, I'd like to have it later.

Response: The Federal Energy Administration is not responsible for requiring intermittent emission control equipment as this is outside their administrative jurisdiction. The responsibility for emission control equipment requirements comes under the jurisdiction of the state involved, with assistance and guidance from the Environmental Protection Agency.

R. Hassell - Kanab, Utah

1. Comment: On page III-15 the statement is made that the air of the Kaiparowits area is currently designated Class II by the EPA, which is a classification sufficiently lax to allow some dirtying of the air. It should be noted that this designation is strictly administrative, is probably in violation of the non-degradation provisions of the Clean Air Act, and is a designation now being challenged both in the courts and in Congress.

Response: The implications of the Prevention of Significant Deterioration Regulations as they relate to Kaiparowits have been discussed further in the Final Statement. The Kaiparowits site is presently in an area that has been classified as Class II with the promulgation of the regulation and Class II limitations on air quality degradation applying to the Kaiparowits proposal.

2. Comment: To protect any air at all, it would certainly be the air in a region which contains the nation's largest concentration of national parks,

national monuments, national recreation areas, and national forests. The prospect, therefore, that the area will remain in a Class II airshed is remote, and on page III-30 the statement admits that the project would violate Class I standards for the air over Bryce Canyon National Park. Incidentally, the single paragraph (page III-30) mentioning the degradation of the air over Bryce Canyon, Glen Canyon, Grand Canyon, etc. by the project is certainly inadequate. The national treasure these areas represent are irreplaceable, and they are visited annually by thousands of people who come to enjoy the clear air and beautiful scenery. The loss of the precious resource the clean air of these parks represents is certainly worth more than the eight lines the EIS gives it.

Response: Additional data concerning impacts in Bryce Canyon and Glen Canyon has been added to the air quality section of Chapter III of the FES.

3. Comment: Even with the best air pollution control devices in full operation, the plant's ability to meet even the lax Class II regulations depends on the ability of the air to disperse the pollution burden imposed upon it, and it is here that the air quality section fails most miserably. The studies done on the dispersal properties of the air above Fourmile Bench researched only two months, May and November, yet residents of southern Utah know that the greatest problems with air stagnation and inversion conditions occur during the months of December, January, and February. Pages II-47 and II-49 make it quite clear that the area is plagued with both low-level and high-level inversions, but these facts are ignored in Volume III when the environmental effects of loading the air with trash are supposedly evaluated.

Response: Additional data have been received since the Draft Statement was written; this new information has been added to the Final Statement. These data include a recently completed temperature sounding climatology study at the proposed Kaiparowits plant site (North American Weather Consultants 1975) and added data from the Lake Powell Research Project (Dr. Williams).

4. Comment: Page VI-4 indicates that there is little chance for emission interaction between pollutants emitted by the existing power plants and Kaiparowits. However, photographic studies using infrared radiation, studies not mentioned in the EIS, have shown sulfur and nitrogen oxides traveling all the way from Four Corners to Bryce Canyon National Park. Certainly this is not visible pollution, but the distance from Fourmile Bench to the Navajo plant is considerably less than that from Four Corners to Bryce Canyon, and it would seem to me impossible for the gaseous elements of the emissions from Kaiparowits and Navajo not to mix somewhere between the two plants. Add Mohave, whose visible emissions can be seen at times in southwestern Utah, and the proposed Escalante plant to the mix, and one has a problem which needs to be evaluated by someone sometime. Unfortunately this EIS chooses to largely ignore these whole questions.

Response: The Final Statement discusses further in Chapter VI the potential impacts on air quality from potential Kaiparowits-Navajo interaction as well as other proposed projects. See also responses to Rudolph, Comment No. 7 and Janke, Comment No. 2, presented in the Hearings section. Also, refer to the Interrelationship section of Chapter I.

5. Comment: With respect to the removal of particulates the EIS is deficient again. The reliability of the equipment for removing SO₂ and fly ash is postulated on the operation of similar equipment at the Mohave plant. However, the Mohave plant is rated at only 1,500 MW, half the size of the Kaiparowits plant. The fact is that the pollution control devices have never been installed on a plant this size before, and their operation to optimum standards is something only operation in the field will tell. Page IV-9 says that the chances of the pollution control equipment failing completely are remote, which I will grant. However, if the equipment only removed 99% of the fly ash instead of the rated 99 1/2 percent, the amount of ash sent up the stacks and into the air would double to 2,238 tons per year. The water contract with the Department of

Interior requires a 99 1/2 percent removal rate, but I can find no indication of what happens if this rate is not achieved. Do we close the plant, cut off the water supply, reduce the load, or, as is more probable, ignore the problem? Certainly the EIS should not assume perfect operation of untried systems and ought to at least mention the possibility of problems and explain the consequences if less than perfect results are achieved.

Response: Concur. Additional discussion has been added in Chapter III of the Final Statement which includes a consideration of not only proposed controls and probability of obtaining those controls, but also controls which would be required by applicable, enforceable regulation.

6. Comment: Another air quality problem the statement ignores is the effect of the fly ash which would escape the electrostatic precipitator even under perfect circumstances. Most of the ash removed would be the large flakes of soot, which cause the most visible form of pollution. The fly ash which escapes into the air is that in the microscopic and sub-microscopic size range. This is the ash which will stay in the air the longest, travel furthest, and have the greatest potential for entering the respiratory system of animals (including man) and the vascular system of plants. The effect of the ash on life systems is largely unknown because it is long-term, and massive projects like that contemplated here just have not been around long enough for us to understand what these effects are. However, the potential for environmental damage is indeed great and should at least be addressed by the EIS.

Response: See response to Phillips, Comment No. 2.

7. Comment: In a relatively short period of time the coal resource could become even more valuable than it is now, but we in southern Utah may well find our coal committed in power production with a technology already sadly behind the times and wasteful besides. Once out of the ground we find 25 percent of

the mined resource never reaches the boiler due to loss in washing and sorting (page III-63). This leaves us with 38 percent of our coal actually getting to the production site. Of the coal burned only 35 percent of the resulting heat actually gets made into electricity (VI-6). Hence, we now have only 13 percent of our coal resource actually being converted into electricity at the plant. Long distance transmission to Los Angeles and Phoenix results in a certain amount of loss due to leakage, conversion of electricity to heat in the wires, etc. If we are generous we might hypothesize that 10 percent of our coal resource actually gets to Los Angeles to help run science, industry, and electric toothbrushes. Hence, by selling southern Utah coal to help Los Angeles and Phoenix to continue their irrational and senseless patterns of growth we are in effect throwing away 90 percent of it, and this at a time when all forms of fossil fuel energy are in increasingly short supply. Such inexcusable waste is one very compelling reason why this project should never be built. Certainly the wasteful nature of the proposed project deserves a large role in Chapter VII, where it can be more easily found and understood.

Response: Concur. The text has been changed in Chapter III. Coal losses through underground extraction methods are for the most part unavoidable. Due to excessive weight and pressure factors, the miners must leave great amounts of coal in place to form pillars to support the roof and walls to prevent subsidence and possible cave-ins. Oil recovery by comparison is much worse; only 15 to 30 percent.

8. Comment: On soils there seems to be a discrepancy between the proposal for covering the fly ash dump, found on page III-72, and the regulations for so doing, printed on page IV-27. The proposal calls for covering the fly ash with a foot of top soil, while the regulations say the cover is to be 18 inches. The statements seem to make it clear, however, that the exact covering over the

ash dump is irrelevant - erosion of the cover will be quick and complete, and eventually all the toxic material in the dump will be released into the environment, either through plants or via Lake Powell. The section on soils seems to be a very realistic appraisal of the fact that while wasting coal we are also condemning thousands of acres of land to either reduced productivity or total desolation. This is not even taking into account the possible adverse reactions of the vegetation to the new pollutants the project will spew into the air by the ton.

Response: The discussion on page III-72 of the Draft Statement relates to the anticipated impacts resulting from the participant's proposal of placing 12 inches of topsoil on the fly ash dump. The 18 inches discussed on page IV-27 of the Draft Statement is considered the minimum depth of topsoil that would provide for growth and establishment of vegetation.

9. Comment: Water rights are another aspect of the report which deserve reflection. We are told on page III-132 that the 2,000⁺ gallons of water per day needed to run the limestone quarry near Panguitch will come out of existing water rights in the Sevier River drainage. Now, the Sevier is one of Utah's most useful streams, so useful in fact that every available drop of water is being used in some capacity, much of it to irrigate some of our most productive farm land. If the water here can be successfully diverted off the land, all such water in Utah will be up for grabs to future industrial proposals. Water for the new town is of uncertain origin (page III-118). The report treats us to the spectacle of long litigation through the courts to unravel the complex water rights tangle on East Clark Bench. Nowhere in the EIS do I find any suggestion that water for the limestone quarry and the new town come out of the water sold to Resources Company, the project sponsor. I can only wonder at this deficiency in the EIS, especially in view of the careful attention in detail some other alternative actions receive.

Response: The Draft EIS indicates that water for the limestone quarry would not come from the participant's allocation of Colorado River water. Water in the Sevier River Basin would be appropriated. With regard to the new town, the DES states that litigation may be required to determine if some of the ground water that would be pumped is Lake Powell water in bank storage and thus require a water service contract. There is a contingency plan that water from the participant's 102,000 acre-feet per year allocation would be used for the new town if sufficient ground water cannot be developed. Approval of a recent application with the Utah State Engineer submitted by Mono Power Co., New Albion Resources Co., and Resources Co. would allow 10,000 acre-feet per year of water to be used to supply part of the water needs of the new town. This information has been added to the "New Town" section in Chapter I.

10. Comment: This thorough attitude, however, has managed to virtually ignore the almost complete destruction of the pinyon-juniper stand on Fourmile Bench, the plant site itself.

Response: The potential removal of 1,170 acres of pinyon-juniper is discussed in Chapters II and III. Chapter VI identifies the long-term effects of the project should the power plant be built as presently proposed.

11. Comment: The pinyon-juniper stand on Fourmile Bench is indeed only a small part of our Utah heritage, but it is important to our future. The EIS deals very matter-of-factly about the trees here, and to get a clear idea of what is their involvement in the project one must read pages II-159, II-139, III-178, III-202, and V-46. Nowhere is there any mention of the importance of the trees or even any indication that they might be important. Certainly the vegetation section of Chapter V (Irretrievable Commitment of Resources) should at least make a stab at it.

Response: Concur. Additional discussion has been added to the vegetation sections of the Final Statement.

12. Comment: Instead of concentrating on Kaiparowits as the possible first step in this transformation of the land from recreation to heavy industry, the EIS chooses instead to concentrate only on the peripheral problems, like ORV scarring and increased use of parks and primitive areas. Certainly the effects of these changes are not inconsequential, and they are dealt with very well in a qualitative and quantitative way in the EIS. However, the large issue is scarcely touched, and when it is mentioned in the analysis, it is inadequate. The chief large scale degradation of recreational quality in the area will occur at Bryce Canyon National Park, a bare 30 air miles from Fourmile Bench.

Response: Concur. The visual impacts on Bryce Canyon National Park have been expanded in the Final EIS.

13. Comment: On days of air stagnation and inversion the pollution from the plant itself would obscure the view from the rim. It should also be noted somewhere in the EIS that compounding the problem are proposals to strip mine coal on the Skutumpah Bench directly under Yovimpa Point, and a Forest Service proposal to log timber in Willis Creek almost right to the base of the Pink Cliffs. The sum total of these effects will visit a large scale disaster on Bryce Canyon National Park.

Response: Since these activities are not firm proposals, analysis of impacts as they may relate to Kaiparowits were not done. The problems of air stagnation and inversion have been analyzed in Chapters III and V of the Final Statement. The cumulative impacts are discussed in Chapter VI.

14. Comment: The beautiful and unspoiled view of the region is one of Bryce Canyon's charms, and there is no question in my mind that this project poses a

real threat to that view. The only mention of this problem in the EIS occurs on page III-205 where the visual impact of the project on the park is rated as low. While I realize that this is a subjective judgement, there is no attempt in the EIS to justify the judgement objectively. Certainly, however, the cumulative effect of the various aspects of the project on Bryce Canyon deserve a better analysis in the EIS than they have been given so far. Studies by the National Park Service, for example, show conclusively that at night the plant's lights will be clearly visible from the park rim. The effect of standing at Bryce in the evening looking out at the dim outlines of canyons, plateaus, and mesas of the beautiful southern Utah range country will be changed into something quite different and not altogether pleasant. However, the EIS does not even mention this fact.

Response: Concur. A statement has been added in the Final EIS to explain the reason for a "low" rating on page III-205 (Draft) for the visual impact from Bryce Canyon. A statement has been added in the Final EIS, Chapter III to show the visual impacts of stack emissions, lights, and reflective materials.

15. Comment: Several lines 2,000 ft. apart soon add up to a transmission corridor several miles wide. For the highway driver or backcountry enthusiast the encounter with a network of transmission lines in the midst of beautiful views can be irritating. For example, the areas around Page and Cameron, Arizona are beginning to resemble a spiderweb, and the addition of several more lines is likely to severely compound the problem. I certainly support the idea of locating any new lines in existing corridors, but we are beginning to have not only the environmental effects of a new line but a cumulative effect of several lines. The EIS should evaluate the cumulative effect instead of leaving the impression that these new lines are one of a kind.

Response: Data is not currently available to assess the cumulative effects of a number of transmission lines in a single corridor. The alternative chapter also analyzes the alternatives of using the existing transmission system.

16. Comment: The first fact which must be understood, and about which the EIS breathes not a word, is that the social structure of the southern Utah communities most likely to be seriously affected by the project is of a type now mostly extinct in the United States.

Response: It is believed that the composition and number of such communities may be declining, but are not extinct. Refer to Chapter III, Socioeconomic section which has been expanded.

17. Comment: On the item of costs the EIS is completely silent. Despite the long charts of tax revenues, sales taxes, property values, and coal lease revenues, there is not a single word about how much it will cost for new schools, water and sewer lines, law enforcement, and new electric lines. There is no attempt even made in the EIS to show whether or not tax revenues generated by the project will keep pace with expenses to state and local governments, and if not then the degree to which local taxes must rise to keep pace.

Response: Concur. The text has been revised in Chapter III.

18. Comment: One problem of immediate concern is the condition of U.S. 89 from Salina to Page. My reading of the EIS leaves me with the impression that this is to be the haul route for the heavy equipment and supplies for construction of the plant, but even a cursory examination of the road shows that its roadbed is inadequate for large scale heavy hauling, and much of it may have to be rebuilt. The State of Utah has a severe problem raising funds to even maintain its present roads in a travelable condition, and the only way to raise funds for a project like rebuilding U.S. 89 is by raising gasoline taxes substantially. I don't know a single Utah resident that wants that to happen. The "public opinion poll" in the EIS (page III-275) shows that 2/3 of southern Utah residents do not want the project if it involves a substantial increase in taxes, and 40 percent don't want it even if only a small increase is involved. The people

certainly need to be told the meaning of this project for their pocketbooks, and the EIS is just the place to do it.

Response: It is conceivable that the State of Utah may have to raise state gasoline taxes, but this would not be as a result of the present plans for Kaiparowits development, or any route development associated with Kaiparowits. It is possible that with the operation of Kaiparowits, i.e., the additional roads, and route usage, that indirectly the Kaiparowits project (as with any other major social change project) would have the impact of necessitating increased gasoline taxes to maintain existing roads. The magnitude of impact associated with U.S. 89 and possible increased taxation for maintenance is unknown at the present time. This information has been included in the FES.

19. Comment: The EIS does a good job of evaluating the direct effects on the region's livestock industry. Subjects like loss of forage, both temporary and permanent, and the danger to the area's surface and ground water reserves are treated adequately and thoroughly. However, the effect of the increased population on the industry is likely to be more devastating than the loss of forage and the loss of water combined. Cattle and people don't mix in this country, but the EIS doesn't even mention this topic.

Response: The possible disruption of livestock operations is noted in Chapter III, pages 233-234 of the Draft EIS.

20. Comment: There are two statements in the EIS which are demeaning to a particular point of view and should be eliminated or rewritten. The first occurs on page III-11 and is repeated on page V-9. It states that those Utah residents who enjoy the quiet, unspoilt solitude of a wild southern Utah would be "bothered" or disappointed" by the industrial development being planned for the area. The choice of these words seems to indicate that the writer considers the loss of this land to those of us who love it as it is, as something akin to

the feelings of a gourmet who finds out that his grocery store is temporarily out of caviar.

Response: Concur. The text has been revised.

21. Comment: The second objectionable statement occurs on pages III-297-298. The paragraph in question virtually accuses southern California and Arizona conservationists of hypocrisy in using electric power while decrying the destruction of beautiful places to produce it. It might be of interest to the writers of the EIS to know that southern California and Arizona conservationists have never had a choice of where the electricity that comes into their homes is produced. The decisions are not made in elections but in corporate board rooms into which conservationists are seldom invited. It should also be noted that Kaiparowits is not being proposed to meet the needs of present users, but to supply a future demand based on these regions' projected growth. Apparently no one has seen fit to ask the present residents in the load center if they feel that the projected growth is desirable, and in view of the impacts described on pages III-299-334 the results of a poll in the market area might be most revealing. One certainly is no hypocrite by defending wild places, even those one has not seen, from the ravages of illogical growth, greed, and misplaced priorities. One need not even be an advocate of non-growth programs to advocate the saving of southern Utah from power plants and their ravages. Certainly the paragraph in question is way out of line, is based on questionable premises, and should be eliminated from the EIS.

Response: Concur. The text has been revised.

22. Comment: The first area of concern relates to the size of the proposed project itself. All the time stories of the project circulated around southern Utah we were never sure as to whether we were discussing a 3,000 MW or a 6,000 MW plant. I assumed with the publication in Volume I of the EIS, the power

company proposal for a 3,000 MW plant, that we finally had something we could really talk about as a firm commitment. However, I see by the pages VIII-221-224 that not only is the commitment to 3,000 MW not definite, it does not even seem to be the participants' first choice. On pages VIII-221 we find that if the Secretary of Interior should decide a higher figure would be appropriate, "...the participants would be receptive." This kind of circular double-talk is particularly distressing because it means that we may be unaware for years of the true ultimate nature of the project we are discussing in this report.

If we are really serious about the environmental impact process then we need to evaluate in detail the largest possible project on the site or else declare in a legally binding way that the evaluated project is the maximum that will be allowed. The way we are going about it is like evaluating the effect of logging a forest on a tree-by-tree basis...

Response: See response to Swensen, Comment No. 5.

23. Comment: While we are on the subject of power plant size, the withdrawal from the proposal of the Salt River Project, which had owned 10 percent of the proposed generating capacity, has now presented us with the alternative of a smaller plant than that proposed. This is an alternative I expect to see fully considered in the final EIS. The remaining members of the consortium are now trying to put the uncommitted 18 percent of the project up for bid, and they should not be allowed to do that unless the alternative of a smaller plant is actually considered....

Response: The participant's proposal described a 3,000 MW generation station. The use or sale of power is not within our jurisdiction to regulate, monitor, or question. Therefore, the alternative of a plant smaller than 3,000 MW was not discussed in Chapter VIII.

24. Comment: This brings us logically to the next topic of importance, namely the need for the project itself. In the last analysis the only assurance we

have that this project is a matter of the future survival of Los Angeles and Phoenix is because the power companies tell us that it is. Commenting on how useful it would be to have an independent analysis of the future demand in the market area, the EIS states (page I-40) "...no such comprehensive projections have been made..." One might be tempted, therefore, to assume that in their proposal the companies are working in their own profit-motivated self-interest, which may or may not be the same as the interests of the market area consumers or the rest of the country. Certainly it ought to be the function of an EIS to evaluate the need for the project objectively rather than simply printing up power company propaganda.

Response: See response to Rudolph's Comment No. 6.

25. Comment: Certainly somewhere at sometime we need to take a careful look at the true extent to which the industrialization of the Colorado Plateau is being planned and give the owners, the American people, a chance to voice their opinion on the future of this magnificent concentration of scenic beauty, and I suggest that the EIS for this project would be an excellent place to take that look..... We need a comprehensive survey of the cumulative effects of this development before we choose to start down this road, and this EIS is where the analysis should begin. The statement instead chooses to treat Kaiparowits in virtual isolation, and the other industries its presence is likely to spawn are completely ignored. This is probably the major omission from the statement, and unless we get an analysis of the total picture we are likely to carve up southern Utah without ever truly understanding what it is we are doing.

Response: See responses to Rudolph's Comment No. 7 and Janke's Comment No. 2.

26. Comment: The section (actually only one page, VIII-354-355) on solar power in the EIS states that using solar energy to generate 3,000 MW of electricity is not feasible, and here I have to agree. However, the choice is not to come

up with 3,000 MW of electricity but perhaps with a way of not having to come up with the power at all. Solar power can now be used to do jobs electricity has traditionally done, and combined with a strict program of energy conservation Los Angeles might be saved without destroying southern Utah.

Response: See response to Swensen's Comment No. 4.

27. Comment: Another existing technology overlooked by the EIS is the use of garbage and agricultural waste in producing methanol, a clean-burning, safe fuel which can be used directly in homes or in power plants without producing any SO₂ or fly ash. The city of Seattle is currently working on a plant that could handle 1,500 tons of waste per day, and in view of the amount of garbage generated in Los Angeles and Phoenix, these two centers should be able to do even better. Certainly this wouldn't meet all the needs of the market area, but a combination of these ideas, together with a slower growth rate for the Los Angeles area (something which would benefit everyone) and we could eliminate the need for Kaiparowits and more plants like it, not just now but well into the future.

Response: The question of burning solid wastes for power, and alcohol production is discussed in the Final EIS. It was concluded that direct burning could produce only a small portion of the power needed in the Los Angeles area.

R. Hamblin - Kanab, Utah

1. Comment - Number one, in the statement as it was said there had been no private study to determine a real need for the power and the government itself would like to see a study of this type take place. I would like to see this study of a private concern included in the final draft of this environmental report because I don't see any reason for building a plant if we don't need it.

Response: See response to McComb's Comment No. 1 (Salt Lake City hearing).

2. Comment: Number two, I didn't see anything in the environmental report that said what would be done with the plant facilities itself after it was done. The plant life is expected to be 35 years. I am sure there will be other buildings that go up around it but at the end of that 35 years will it be left to stand or will it be torn down and landscaped, a golf course put on it, whatever you know.

Response: At this time the participating companies do not have plans to remove any of the structures upon retirement of the generating station. It should be noted that the plant could operate anywhere from 35 to 70-plus years.

3. Comment: Another thing that I think is real important to the people here in Kanab and I didn't see it included in there: What affect will the new road that goes from Tropic out to hook into 89, what affect is that going to have on the economy of Kanab? Now I saw in the report where it said it would take food for sixth year and so forth but I didn't see where it said how many service stations or motels or cafes will have to close here because the tourists go into the north. I am sure a person from California who wants to see the parks will go through Zion, Bryce, Lake Powell, come to the Grand and go home. A person from Salt Lake would come down and go out this new road and back to Salt Lake. I think it will have a real effect on the economy of this town here and I would like to see some type of statement there. I am sure if we can figure out how many deer are going to be affected we should be able to figure out how many people will be affected because we are as important as the deer.

Response: As discussed in the Socioeconomic section Chapter III, if a new highway is built between Highway 89 and Cannonville, as proposed, substantial adverse economic impact is expected to occur in Kanab especially in relation to businesses dependent upon tourist trade and the traveling public.

4. Comment: Another thing to go along with that: I didn't see where it came right out and said that the company would build the schools and the jails and

hospitals and roads. How are us 5,000 people going to build roads and jails and so forth for 15,000? What's going to happen to my students in my school during the ten-year period that we have built the facilities out there and we are waiting for the money to come in? Are we going to go back to slate boards or will there be a government grant?

Response: Pages I-323, 324 of the Draft Statement outline schedules and means of funding municipal services. This also appears in the Final Statement.

5. Comment: Another thing that is a major impact to me - and I am sure it was mentioned in the report but it wasn't given near the detail that amount of emissions from the stacks will have - and this is what about the off-road vehicles, recreational vehicle tote-goats tearing around in the hills up there are going to tear up a lot more than building the town, building the plant. I don't know how you would ever do a study on it but if it's possible I would like to know and if it's possible maybe we can set some areas aside beforehand that you can't have a motor vehicle in. That's something I would like to see in it.

Response: A description of the effects of ORV use is given in Chapter III, Recreation. There have been some good studies ("Peine - 1972" and "The Recreation Vehicle in California - 1974") on the characteristics of ORV users, but there is little information that would help in predicting the magnitude of the impacts from ORV use.

6. Comment: Another thing I wonder about: In Europe I have been informed they are mining 90 percent of the coal out of the mine. Not 50 percent. They get 90 percent of it. According to the statement they were going to aim for 50 percent. Why can't we get 90 percent if they can over there? I think we should set aside a statement in there that says they have got to obtain so much efficiency in their coal mining. There is no reason to leave 840-million tons of coal there that could be used sometime in the future.

Response: The text has been clarified concerning the 50 percent removal. The 840 million tons will not be left in the ground but rather 840 million tons in place would be required to provide the 420 million at 50 percent recovery.

B. Wood - Kanab, Utah

1. Comment: First of all I would like to make a comment about the vegetation of the limestone quarry. The summary indicates that the limestone quarry vegetation is indicated by the water that is there. This is true only for the drainages because the knolls which are either red limestone or white limestone are dominated by pinyon-juniper, bristle-cone pine and ponderosa pine and these plants usually do not indicate water-loving situations. The drainages are dominated by tall-growing rabbitbrush and this rabbitbrush is one of the rabbit-brush that is very common to the washes in Kane County and probably has invaded that area as a result of overgrazing.

The statement or the summary indicates that the tree age in the limestone quarry area is about 420 years for mature trees. This statement may be somewhat misleading because most of the pinyon and juniper, at least 60 percent of them, are less than a hundred years old. There are a few old trees and these are old ponderosa pine trees and a few bristle-cone pine but the bristle-cone pine surprisingly is not of the same age as Bryce Canyon immediately to the south.

Response: Concur. Additional information has been added to the vegetation sections in Chapters II, III, and V of the Final Statement.

2. Comment: The statement also indicates that the prairie dog town is on the limestone quarry site. This is not true. There are no active prairie dog towns on the proposed limestone quarry site except for some of the alternate sites. Now some of the alternate sites do have but the primary site does not have any active prairie dog town on it nor could I find any evidence of old or ancient prairie dog towns.

Response: We have attempted to make clear in the FES that the Utah prairie dog occurs in the vicinity of the proposed limestone quarry with the nearest colony within about one-half mile of the actual quarry site boundary.

3. Comment: Another statement that's in the summary is the status of the Pronghorn antelope herd on East Clark Bench. We have not seen any antelope, speaking of our study team, since August of 1973. Now there may have been other sightings because of the other people in the air helicopters and other aircraft, but from on-ground sightings as far as we know the last antelope that our team has seen was on Nipple Bench. It was a lone male and he was seen in August of '73 and we haven't seen any of the herd since that time. It's my personal opinion that they have either been poached or harrassed to the point that they have either moved out of the area or they have died.

Response: The Staff Wildlife Specialist has personally observed several antelope during the past year (1975) on East Clark Bench and along the lower Paria River. We agree, however, in your opinion that the band of antelope transplanted from northwestern Utah to East Clark Bench has declined greatly in number. The significant point is that this is historic antelope range on which the State of Utah is actively engaged in reestablishing a herd.

L. Garrison - Kanab, Utah

Comment: I suggest that your statement runs short in evaluating the use of alternative energy sources, also alternative sites outside of Utah. I strongly feel that a regional study of the area should be made. Kaiparowits is only the first of five or six power plants. These plants should be looked at as a whole, not just one at a time. I believe that the social and economical aspects of the project should be dealt with also in more detail.

Response: The Alternative Energy Sources and the Alternative Sites Outside of Utah sections, Chapter VIII, have been revised in the Final Statement. A

regional study was not undertaken for the same reasons cited in our response to Rudolph's Comment No. 7 and Janke's Comment No. 2 as presented in the Hearings Comments section.

R. Coshland - Phoenix, Arizona

Comment: It should be noted that the DES offers no alternative source of water.

Response: There is no reasonable alternative source of water for the Kaiparowits power plant. Although numerous wells might be drilled into the Navajo sandstone aquifer, the Navajo sandstone is, we believe, recharged from Lake Powell. This means that even ground water supplies would eventually come from the Colorado River.

R. B. Scott - Phoenix, Arizona

Comment: There are a number of uncertainties regarding the basis of the evaluation of the environmental impact of the proposed project. The principal concern is the lack of or improper consideration that four additional coal-fired power plants are proposed for construction in the vicinity and that an existing power plant (Navajo) with two units are already in operation and another under construction is only 30 miles to the south. The combined impact of the proposed and existing plants upon the ambient air has not been evaluated. The Kaiparowits impact on air quality appears to be based upon the assumption that background pollutant concentrations are zero. Such background concentrations certainly are not the case now and with the construction of additional power plants in the area will certainly increase.....

The Draft Environmental Impact Statement included minimal discussion of the significant deterioration of air quality. This should be expanded since deterioration of the air quality in the region can drastically affect many

national parks, monuments and recreational areas, as well as other scenic wonders which abound in the area.

It should be noted that Arizona State Rules and Regulations for air pollution control require that measures be taken to prevent deterioration of air quality. The rules is a portion of the state's ambient air quality standards and is as follows:

"Rule R9-3-208 Anti-degradation. These standards shall not be construed as permitting preventable degradation of the air quality in any area of the state."....

Therefore, it is the recommendation of the Arizona Department of Health Services that the Environmental Impact Statement for the Kaiparowits power project be expanded to include the accumulative impact of existing and proposed power plants on the air quality of the region."

Response: These data and additional information were received from the Arizona Department of Health Services. They were reviewed and utilized in the Final EIS.

G. McKennis - Phoenix, Arizona

Comment: It's my feeling that the whole Aqua Fria alternative in general was not adequately addressed by the Impact Statement.

Response: Concur. Text for the Aqua Fria Alternate (Chapter VIII) has been revised in the FES.

K. Dahl - Phoenix, Arizona

Comment: Just a cursory glance shows that apparently just utilities demand forecasts were included and no independent study of what the service area here in Arizona's actual demand for electricity will be in the future. I

think it especially important because our cost of electricity here is going up. Our rates are going up which concerns me personally; that was the part. And I think once the costs go up the demand is going to go down and this isn't included in any other figure in there I could see.

Response: See response to Rudolph's Comment No. 6.

J. McComb - Phoenix, Arizona (Mr. McComb also testified at Salt Lake City hearing)

1. Comment: We believe that the Arizona Public Service Company's projections used in the Draft Environmental Impact Statement are high for the following reasons:

- (1) They do not take into account the effects that recent and future price increases will have in reducing demand.
- (2) They do not take into account energy conservation practices that can and will be put into effect before the first power is available from Kaiparowits six years from now.
- (3) They do not consider the impact of policies designed to reduce peak demand.
- (4) They do not consider the benefits to be gained from the recently formed Cactus Power Pool.

This summer the Salt River Project chose to drop out of the Kaiparowits project. If we were to accept the data in Figure 22, which is Chapter 8, Page 368 of the Draft Environmental Impact Statement, this decision should leave the Salt River Project with an inadequate reserve margin beginning in 1982. However, it is my understanding that the Salt River Project believes that they will have adequate reserves.

Figure 22 places the Arizona Public Service Company roughly in the same position as the Salt River Project. If the Salt River Project can get along without Kaiparowits then why not? Then why can Arizona Public Service Company not do likewise?

"The factors mentioned in this statement plus others lead me to seriously question the validity of the forecasts used to justify the need for Kaiparowits. The Federal Energy Administration report appended to the EIS suggests the need for an independent analysis of demand forecasts. The Draft Environmental Statement prepared in conjunction with the proposed Palo Verde Nuclear Plant, in which Arizona Public Service Company is also a participant, notes that the "growth rate of forecasts of the applicant represent an upper bound." Obviously the Department of the Interior should not have relied solely on the utility forecasts. The final Kaiparowits Impact Statement should include an independent analysis of this subject. That concludes my statement.

Response: We were unable to obtain an independent evaluation of Arizona Public Services' demand forecast projections other than those furnished by the Federal Energy Administration. We were able to obtain an independent evaluation of the forecasts for Southern California Edison Co. and San Diego Gas and Electric Co. from the California Energy Conservation and Development Commission. However, this evaluation was classified "unofficial," therefore, we were unable to use it. Also, see response to Rudolph's Comment No. 6.

2. Comment: The Draft Environmental Impact Statement does not even consider such alternatives as additional pumped storage capacity which with peak load pricing and other conservation practices could eliminate the need for Kaiparowits altogether, at least for the State of Arizona.

Response: General consideration of pumped storage has been given as one of the hydroelectric alternatives. An expanded discussion of energy conservation measures has been included in the Final Environmental Impact Statement.

A. Zorn - Las Vegas, Nevada

1. Comment: The Summary Section 2, Page 1, states that data for the Navajo power plant is not yet available to evaluate its impact on the Kaiparowits

Plateau. An assessment of the cumulative effects of the bevy of large power installations in the area has to be high on your priority list of essential information to be developed for the decision-makers. How soon will this information be available and will it be included in the Final Environmental Impact Statement?

Response: Additional data that have been received since the writing of the Draft Statement have been incorporated into the Final Statement. This data allows further evaluation of the influence of Navajo and its relationship to potential impacts from Kaiparowits. This information includes review comments and additional data supplied by the Lake Powell Research Project (Drs. Williams, Walther and Malm); Dames and Moore Meteorological and Air Quality Studies of Navajo - 1974; Dames and Moore Meteorological Data for Nipple and Fourmile Bench - 1974 data; North American Weather Consultants - Meteorology and Stability Study 1975; Navajo Generating Station Sulfur Dioxide Field Monitoring Program, September 1975; review comments and additional data supplied by the Arizona Department of Health Services, Air Quality section.

2. Comment: In Section 2 on Page 8 it states there are three major land use plans for the area. Is the proposed plant and its related activities, mining and so forth, compatible with these plans?

Response: As indicated on Page II-344 of the Draft Statement, existing land use plans for the Kaiparowits Plateau area generally considered potential energy developments. This is also indicated in the Final Statement.

3. Comment: Section 3, Page 2. What efforts have been made by the Draft EIS team to verify the data supplied by the project sponsors? Throughout the summary and the full text references are made to predicted effects based on sponsor-supplied data but with no indication that you have checked it out.

On Page 2 of Part 3, for example, it refers to the predicted ambient air concentrations of mercury and selenium arising from the stack emissions but it does not indicate who did it and who checked it out.

Response: BLM has obtained a copy of each air quality study from the participants that is cited and used in the statement. The results have been supplemented with other source studies wherever possible for comparison to further evaluate potential impacts. Predicted mercury and selenium as well as other trace element emissions were calculated by BLM using the assumptions indicated; results in the draft were reviewed by EPA and comments were sought from other individuals knowledgeable in the field. The air quality sections of the Final Statement will also be reviewed by EPA.

4. Comment: On Page 3, Part 3. The adverse visual and air quality effects of some 25 ton trucks making 30 round trips daily in a national park area perhaps also should be addressed in terms of the possible loss of tourist and recreationist dollars to the area.

Response: It would be extremely difficult to predict the loss of tourist and recreation dollars to the state should the project be approved and this road used as a haulage route. The data necessary to complete such an analysis is not available.

5. Comment: On Page 5 of Part 3 it states that the seeding success on the fly ash and scrubber residue could be expected in less than 3 years out of 10 and less than 1 in 5 for other areas around the plant and the new town. What other measures will be taken to stabilize the soil against erosion and whose responsibility will it be?

Response: Once the title of the land has passed from federal to state to private ownership, then the solid waste dump and rehabilitation of the site after abandonment would come under the jurisdiction of the State of Utah and

Kane County governments. As of this date, there are no known state and county laws and regulations that would require rehabilitation after abandonment or ensure that other rehabilitation measures would be successful. Under these circumstances, should the site become a pollution problem after abandonment, then state and/or county tax monies would be used to pay for care of the site.

The Federal regulations would apply in this situation only if the power plant was constructed under a federal right-of-way grant and the land remained in federal ownership. Should this be the case, the power companies would have to pay for care of the site after abandonment.

6. Comment: On Page 6 of Part 3 cost figures are given on the increased Colorado River salinity to downstream users. Does the \$430,000 per year cost figure include the additional costs to the salinity control projects such as those in the Las Vegas Wash - Lake Mead area as well as any extra treatment costs that would be necessary for the Lake Mead water destined for Las Vegas?

Response: The \$430,000 per year is the estimated cost for a 2.1 mg/l increase in salinity of Colorado River at Imperial Dam regardless of the source of this increased salinity. Chapter III of the EIS has been revised to include a brief statement about the Colorado River Salinity Control Act and the Colorado River Water Quality Improvement Program.

7. Comment: In Part 5 on Page 8 would ask what efforts have been made to consult with the airport planning officials in Clark County with regard to the possible loss of the Eldorado Valley and Glendale Airport sites?

Response: The status of the Eldorado Valley Airport plan is unknown. The airport probably would not be built for another 10 or 20 years. According to the FAA, there is no airport at Glendale.

8. Comment: In Section 8 and other paragraphs related to solid waste disposal and contamination of the aquifers. We are concerned about the possibilities of

the contamination of Lake Powell and downstream waters since this could affect our area. How will the disposal site be maintained after the plant's useful life is over? What is to prevent erosion of the cover soil or seepage into aquifers if surveillance is not maintained?

Response: See response to previous Comment No. 6.

9. Comment: Though the statements indicate the trace elements will not be going out the stacks, they don't discuss the amount of trace elements which are bound to be contained in the fly ash and scrubber sludge. Is there any estimate as to what portion of the 40 million cubic yards of ash and 16 million cubic yards of sludge that will accumulate over 35 years will contain trace elements? What are the half-lives of the elements involved and what will be the effect of their accumulation at the solid waste disposal site for a period of 35 years? What happens as the elements decay within the disposal site?

Response: Estimated quantities of trace elements that would be released from the stacks to the atmosphere are discussed in the air quality sections of Chapter III of the Draft Statement. Trace elements associated with the fly ash captured by the emission collector system and trace elements associated with bottom ash would be deposited in the solid waste disposal pile. The radioactive species in coal are very similar to those in soils. Utah soils in general contain approximately 1 pCi per gram of such radioactive nuclides as Ra-226, Ra-228 and Th-228. Based on the analyses of coals that would be used by the Kaiparowits power plant, and assuming all of the coal radioactivity would be associated with the ash after combustion, the calculated concentration of Ra-226 in the ash would be 1.44 picocuries per gram, Ra-228 2.00 pCi/g with Th-232 and Th-230 in the same range of values. These levels are within a factor of 2 of the average soil radioactivity concentration. Also see response to Crall's Comment No. 1.

H. Booth - Las Vegas, Nevada

1. Comment: I nevertheless, believe that the EIS is seriously deficient in the scope of its considerations and may soon become even more so with the passage of the proposed amendment to the National Clean Air Act. The Kaiparowits EIS addresses itself to but one of the many existing and proposed coal-fired power plants whose combined effects on the environment are without doubt an additive.

Response: See responses to Rudolph's Comment No. 7 and Janke's Comment No. 2.

2. Comment: Furthermore, we feel the changes to the Clean Air Act now being considered by Congress, if passed, must result in a revised EIS in order to address new degradation regulations that will be required. These changes have particular bearing in the southwest.

Response: The implications of the Prevention of Significant Deterioration of Air Quality Regulations are no doubt the single most important air quality factor to consider with regard to Kaiparowits, and have been discussed further in the Final EIS. The proposed legislation being considered by both the House and Senate to amend the Clean Air Act may alter the final form of the requirements. The Air Pollution Control Journal (December 1975) indicates that committees of both the Senate and House seemed to be moving toward enactment before the end of the year.

3. Comment: A factor of profound concern in this region of superlative scenery and superior visibility, the problem seemingly not adequately addressed in the EIS, stems partly from the generally observed increase in particulate concentration with altitudes up to the level of affluent plume access and through which distant landscapes must be viewed.

Response: A complete scenery evaluation was completed for the Kaiparowits Plateau impact area and is included in Chapter II. Major emphasis was placed on other "highly scenic lands" in the so-called Golden Circle of Parks. The discussion of impacts on Bryce Canyon National Park and Glen Canyon NRA was expanded in the Final Statement. Visibility is covered in Chapters II and III in the Air Quality and Recreation sections.

4. Comment: The Environmental Impact Statement in addressing these Clean Air Act provisions and proposed amendments should consider the capability to adequately monitor air quality throughout the affected region particularly within each of the Class 1 areas concerned.

What is required of course is the acquisition of background air quality measurements representative of each of these areas for a period of up to at least 1 year and preferably over a period of several years prior to the time the first of the proposed power plants goes on-line. This is necessary in order to evaluate the actual contribution of regional energy complexes to subsequently observe air quality levels. We are not aware of any air quality measurement programs currently in progress within the boundaries of Class I lands.

Response: We are not aware of any areas potentially influenced by the proposed project that have been designated as Class I lands. The implications of the Significant Deterioration Regulations to the Kaiparowits project are discussed further in the Final EIS. As discussed, there are lands in close proximity which have the potential for reclassification to Class I. The National Park Service is presently studying available data on air quality and potential impacts of the Kaiparowits project on their lands. The participants have also indicated that they will perform environmental monitoring and have in fact had preliminary discussions and development of plans with the Eyring Research Institute at Provo, Utah.

5. Comment: The two points that I will particularly address are related to what I consider to be a major error in the assumptions that have been made on the degree of control that will be accomplished in air pollution and in the adequacy of the investigation to the problem of trace elements.

Figure 1, Chapter III-16 entitled Summary of Predicted Emissions and Applicable Emission Control Studies lists the standards for SO₂, NO₂, and particulates control considered applicable to Kaiparowits. These are listed in the EPA standards Arizona, Utah, and Interior Department standards. First of all, Arizona standards are not applicable. Since the plant will be located in Utah and in no way can the Arizona standards ever be enforced so in considering this question, we can eliminate the Arizona standards. But the thing that concerns me the most is the listing of 99.5 percent as the Department of the Interior standards and it is labeled a standard...

Particulate control is a design criteria for the equipment to be installed. It is not an enforceable operational control standard. The Interior Department standards for particulates is the operational requirement of 97 percent for a month and 96 percent for each 24 hours. On July 9, 1975, Utah adopted new air pollution control regulations. I have a copy of those which were supplied to me by the Utah State Department of Health and I quote.

"In all areas of the state, air pollution control equipment and processes shall be selected and operated so as to afford the highest efficiency and lowest discharge rates that are reasonable and practicable. Reasonableness and practicability are as determined by this committee are taken into account. Among other things the concentration character of the air contaminant in the gas stream, technical feasibility for control, and cost benefit relationships."

Response: Concur. The Final Statement discusses emission rates resulting from proposed controls and the probability of meeting the proposed emission

controls based on available operating experience of similar kinds of equipment. In addition, the Final Statement considers calculated emission control required to meet the most restrictive enforceable air quality regulations applicable to the project.

D. Talvitie - Las Vegas, Nevada

1. Comment: For that reason, your figure in Column 1 showing predicted abated emissions for particulates should be based on the EPA standard of 98.5 percent for average coal and 98.7 percent for worst coal. Since a small change in percentage on a plant of this size can't make significant difference in the total amount of discharge, 1 percent of 10 is very little, 1 percent of a million is quite a lot, you know. And since the predicted emission is the basis for determination of the project impact of the particulate on the environment, I would suggest to you a need to reexamine the Impact Statement using the applicable enforcement standards as a basis for your calculation.

Response: The Final EIS discusses predicted emissions on the basis of proposed emission controls as well as emission controls calculated to be necessary to meet the most restrictive enforceable air quality regulations applicable to the project. See responses to Spence's Comment No. 1 and Williams' Comment No. 2.

2. Comment: This same error is found elsewhere in the report. For example, Figure 1, Chapter III-20 also refers to the Interior Department contract as a base for 99.5 percent control -- again a misinterpretation of the Interior Department contract, using design criteria in converting it into an enforceable regulation for operation. Why can't design criteria be interpreted as an enforceable operational regulation? ... Secondly, no enforcement action can be taken on any basis other than operational regulations.

Response: The qualifying statement on Figure 1, Chapter III, page 20 of the DES has been expanded to indicate that 99.5 percent control is only a design criteria.

In addition, refer to response to previous Comment No. 1.

3. Comment: Turning to your charts again, and the narrative on Chapter III-19, I find the same error in terms of SO₂ predicted emissions. Dr. Weir's scrubber is right here in Clark County and is no doubt capable of 90 percent control.

Response: Additional discussion has been added to the Final Impact Statement concerning the proposed sulfur dioxide control, calculated sulfur dioxide control based on meeting the Class II limitations which are the most restrictive federal standards, and the State of Utah position on control measures required.

4. Comment: Turning to the predicted releases of trace elements, Figure 8, III-32 and the narrative III-33, basic assumption 7. Trace element emissions are based in your document on the assumed review of removal of 99.5 percent of the particulate matter. Now if we are not going to be able to enforce 99.5 percent of the particulate matter, that is going to automatically effect what your computations have to be in terms of the trace element emissions. So once again, it goes back to what I find to believe a fault in your Environmental Statement.

Response: Additional discussion of trace element emissions from lower particulate collector efficiency has been added to the Final EIS.

5. Comment: On comparison of the data given on trace elements on Page II-39 and found in Figure 26a, Page II-83, we find discrepancies in the data in some cases, by as much as a factor of 100. So I ask you the question, which is the correct figure? Apparently the analysis reported on Page II-83 was done by a

firm known as Trapelo-West.... What methods of analysis were used? What quality controls were used? Have their findings been verified in any way?

Response: The indicated concentrations of radioactivity in coals in Figure 26a, Page II-83 should have had a minus sign on the exponential. This has been corrected in the Final EIS.

The analyses on Page II-83 were done by five groups using different techniques. Because of the variability shown in the analyses, the mean and standard deviation of the concentrations was computed and the mean was used in the estimate of emissions.

6. Comment: Some of the questions I have in terms of trace element relates to the possible long-term effects on our water supply which by your own Impact Statement, there is a hazard. We are aware of the mercury problems in Lake Powell. We are aware of many of the problems particularly how aware I am of the waste pile in the middle of Salt Lake City. I drove by it too many times and became aware of it too long ago. The waste piles of the waste matters, the ash that is going to be set aside as well as the nuclides going into the atmosphere. The hazards to Lake Powell which will eventually reach Las Vegas water supplies. Possible mercury, possible long-lived radionuclides because some of the things in your report go to uranium, strontium and thorium. These are not short-lived nuclides. They have half-lives thousands of years. So I would suggest to you -- I did not find a reference to the half-lives of elements in your Impact Statement. I did not find a reference in your Impact Statement to the possible long-termed cumulative buildups. And I think this bears considerable more investigation before we proceed, particularly if it be true as seems to be indicated in your statement that in terms of mercury, particularly, we are reaching a delicate area of balance in Lake Powell.

Response: Additional discussion of estimated mercury release, atmospheric

concentration, deposition, potential movement into Lake Powell, and potential long-term impacts have been added to the Final EIS.

See responses to Cox's Comment No. 1 and Zorn's Comment No. 9 for a discussion of the release of radioactive nuclides from the proposed Kaiparowits plant.

7. Comment: 1. What is the total cumulative effect of trace elements from a series of power plants in the same geographical area? Is there any possibility of a cumulative effect in terms of radiation? In terms of mercury?

2. Is there a possibility of increase in radiation levels in the Colorado River, Lake Mead, and Lake Powell? (from fall-out from a series of power plants and from the waste piles) If so, how much?

3. Is there a potential for increased mercury contamination of water? To what degree? (This has been pointed out in the impact statement as a potential hazard, I believe it warrants further investigation.)

4. Is there a possible cumulative human exposure to radiation from the combined exposure in water and air? To what level?

5. Since trace elements not emitted to the air will be sent to a landfill for waste products, is there a possibility that the waste pile may become a hazard similar to that of a uranium mill tailings pile? Any possibility of radon? Since there is no guarantee of continued, surveillance over the waste pile beyond the life of the plant, thorough investigation into potential hazards from the waste pile is needed.

Response: Item Nos. 1 and 2: See responses to Spence's Comment No. 5, Crall's Comment No. 1, and Cox's Comment No. 1.

Item No. 3: Additional discussion of potential impacts from mercury releases from Kaiparowits has been added to the Final Statement.

Item No. 4: The text of the air quality section in Chapter III discusses the estimated short-term concentrations in air resulting from radioactive

releases from the plant and states that predicted concentrations are expected to be significantly below maximum permissible concentrations.

The responses to Cox's Comment No. 1, and Zorn's Comment No. 9 discuss expected long-term deposition levels in soils and solid waste disposal areas and the relationship of these levels to natural radioactivity in soils. Very little is known of the potential contribution to lung dose and the potential health effects from small increases to the existing natural radiation background. Dr. Pendleton at the University of Utah, who has been working in this area, has indicated "Our next goal is to actually quantify such radiation effects into human health effects. It's an untouched area."

Item No. 5: Refer to our responses to Zorn's Comments No. 8 and No. 9.

R. Snelling - Las Vegas, Nevada

1. Comment: The second point I would like to make is that even if you accept the thesis that you can use Class 2 areas for a frame of reference, the only parameter that we have to grab a hold of to evaluate is SO_2 and particulates at ground level and there is two problems with this. One is -- the main problem as I see it anyway, is not particulate loading per se, or SO_2 per se, but on this ability and these areas and it is difficult if not impossible to relate particulate loading to visibility and that it is a function, not only a particulate concentration but particulate size distribution and chemical make-up of the particulates themselves. In addition, in the problems compounded by the fact that regulation supply to particulate concentrations at ground level and that even at expanded distances of 50 miles, the stable meteorological conditions, your maximum concentrations are going to be at an elevation other than ground level, 7,000 feet up in the air and is that concentration that is going to most affect visibility, not the concentration on the ground. And I don't believe that question has been addressed in the Impact Statement.

Response: Additional data has been gathered from the Lake Powell Research Project. See response to Williams' Comment No. 1.

2. Comment: My third point is and I guess I am addressing the question that you've asked several times, has the Impact Statement addressed adequately the questions that need to be answered, whether you agree with their answers or not. I say it doesn't in one very important aspect. You cannot look at the Kaiparowits plant in and of itself. That is not the problem. What we have to look at is not just the Kaiparowits but Kaiparowits and Huntington, Warner Valley and Escalante and Navajo and Mohave and Four Corners and San Juan and a number of others that I couldn't dig up their names tonight. It is the total impact of the total energy resource development program that is going on in the Four Corners area and that has to be addressed. In total, before we can make any type of quantitative statement as to what the effects on the National Park Systems or those national resources out there is going to be, and I believe very strongly that that is the approach that has to be taken. Kaiparowits is one small part of the total problem and the total energy resource development program that has been proposed for the Four Corners area and if you look at the whole thing in total, it is just scary and if we can continue looking at each one of these projects, one at a time, we are going to destroy that area before we know it and we have got to take a step back and look at the total picture. Unfortunately, and I admit this, that the state of the art and regional modeling is in its embryonic stage. There is no doubt about it but I think we still have to make an attempt to do this and it is just foolishness not to and that hasn't been done in the statement that I can see in the studies that back up the statement. Thank you.

Response: The potential interaction of Kaiparowits with the Navajo plant is discussed in Chapter VI of the Final Statement. With regard to other power plants, see response to Rudolph's Comment No. 7 and Janke's Comment No. 2.

P. Fradkin - San Bernardino, California

1. Comment: But, there are two immediate issues that we would like to address in the Environmental Impact Statement which is considered with immediate consideration of today's hearing. They are the almost total reliance by the Bureau of Land Management on the utility industry for information justifying the need for the plant, in terms of forecast demand for electrical energy and the routing of transmission lines.

Response: Refer to response to Rudolph's Comment No. 6.

2. Comment: A further criticism of the Environmental Impact Statement is that it contains little, if any, mention of the cumulative impact of all the coal burning plants planned for construction in Southern Utah and Nevada that will eventually serve Southern California markets. I might add there is one planned to serve Northern California markets.

Response: See responses to Rudolph's Comment No. 7 and Janke's Comment No. 2.

3. Comment: The Commission just concluded a long series of hearings on the suitability of the energy forecast of the State Public Utilities Commission. While these hearings were inconclusive and no new forecast came out of them, it was the consensus of the hearings that present forecasts are much too high and while I have not adjusted the 6.8 per cent increase in demand, figures used in the EIS in this statement, I would add only to my understanding that all current estimates are way below that figure. And the final Impact Statement, you might take another look at that 6.8 percent.

Response: Refer to response to Rudolph's Comment No. 6.

4. Comment: The following statement in the Environmental Impact Statement addresses to the problem of cumulative impact of transmission lines and these lines would have at least as much and is talking about the other plant planned, would have at least as much if not more impact than the Kaiparowits project.

Gentlemen, now this is a very tantalizing statement but we would ask that you go further and clearly define what those impacts would be before approval for Kaiparowits is given, the cart before the horse.

Response: There are no data available to be able to assess the cumulative effects of transmission lines in a single corridor. Also, the alternative chapter analyzes alternatives of utilizing the existing transmission system.

5. Comment: What happens beyond terminal point of end of these transmission lines? What happens when additional transmission lines have to be caused through the urban areas of Los Angeles and that would be a sociological effect that might even be vaster than the environmental impact in the beginning and who is going to measure that? It's where your assessment ends is Serrano. Is that the name of the station. Okay. From that point on, whatever is built gets caught heavily on populated urban areas and at least in my experience with dealing with transmission lines both in designated urban areas and in the populated areas, their impact might be somewhat similar to a freeway. A shadow is cast. It is cast not only on property values surrounding it, it is cast perhaps on what would happen in terms of population in that area and I don't think that any detailed studies have been made of this but when such a massive amount of electricity, not only from Kaiparowits but from all these other plant facilities in this area will start coming in. This is a vast sociological problem that should be addressed and whether it is by the utilities, yourself, by the city, the county, it seems to be that the same type of shadow is created by the freeway -- is created by a large conglomeration of transmission lines.

Response: It is recognized that an in-depth, extended market analysis of needs and demands would be invaluable. However, such information was unavailable from either independent sources or the participants. Also, it was BLM's view that the Final Statement would be completed before such an extensive study could be contracted for and completed by a consulting firm.

B. Mills - San Bernardino, California

Comment: Now, this is only a portion of the information that has come to us. We have been very deeply concerned because we find that there are apparently from some of these forces, indications of neurological, mental, physical, and genetic damage to humans within a certain distance of these power lines which apparently are producing radio effects in that simply under the power line itself is not the limit of the power line effect being upon people.

Response: The report referred to in Mr. Mills' full testimony was not received. Therefore, it was not considered for inclusion in the Final EIS.

M. Ericksen - San Bernardino, California

1. Comment: The primary policy conclusion reached was that the Kaiparowits project may not be permitted to proceed at this time. The recommendation is based primarily on the fact that the demand increases forecasted are substantially in error and therefore the need for this project has not been demonstrated.

In support of this conclusion, we must emphasize that the recent staff report taken in August from the California Energy Resources Conservation and Development Commission finds there is a wide variation in forecasting techniques used by the major utilities.

Response: Refer to response to Rudolph's Comment No. 6.

2. Comment: In light of the California Energy Commission's task of developing efficiency standards for all electric appliances, improved building design and regulation and pricing alternatives to affect conservation and so a reduction in the rate of demand growth, the staff report found it ridiculous that neither Southern California Edison or San Diego Gas and Electric accounted for the defects in their demand projections.

Furthermore, in view of the uncertainty of prices and mandated conservation surrounding any forecasts, the report noted it advisable to make a range

of forecasts rather than a single forecast as both of these utilities have done.

Response: Refer to response to Rudolph's Comment No. 6.

3. Comment: Further support of this conclusion is found in the Federal Energy Administration's report in reference volume of the Draft Environmental Impact Statement. And I quote "Giving the fact that utility demand forecasts are contested, independent predictions of future demand would be useful in assessments of the need for new generating facilities. But no such comprehensive projections have been made for the Kaiparowits market area." And another quote "Also not discussed are public policy options such as the redesign of electric power rate structures, mandatory conservation which would have widespread impact on energy matters and might effect the need for Kaiparowits." The known fact is that California's PUC and Energy Administration are in the process of putting such public policy options into operation and their effect has not been included in justifying the need for California's 63.4 per cent share of Kaiparowits.

Response: Refer response to Rudolph's Comment No. 6.

4. Comment: Another additional factor that must be calculated into the forecasting of need for this project is the Southern California Edison's August purchase of a 15.4 per cent share in the Palo Verde nuclear generating station in Arizona. The public must be informed as to how this purchase affects the need for Kaiparowits.

Response: Refer to response to Rudolph's Comment No. 6.

I. Eastvold - San Bernardino, California

1. Comment: I would like to begin with a probably the most specific or narrow consideration and that is the impacts of the transmission line on the

prehistoric art sites in Southern California. I have brought along with me today, the Lakeview, California -- seven and a half minute -- topographic maps. The proposed Kaiparowits - the preferred transmission line as you recall comes down Glenn Canyon across the San Jacinto River and then rises up the escarpment of Mount Rudolph and transects the Lakeview Mountains. Under contract with the Riverside Municipal Museum, I recently completed an inventory of all prehistoric art sites in Riverside County. I can say on the basis of that inventory that the prehistoric paintings and prehistoric copy rolls which are very little understood and rare forms of prehistoric art do exist north and west on the flanks of Mount Rudolph in the Lakeview Mountains, and must be ranged as one of the six most significant prehistoric art sites in western Riverside County. The proposed transmission lines would go just about right through the middle of ten sites where there are prehistoric paintings. In excess of 100 design elements, 100 distinct and individual prehistoric paintings.

Response: Concur. Text has been revised in Chapter III.

2. Comment: The transmission lines as far as I can tell would be visible from approximately five of these prehistoric art sites, also along the north and west flanks of Mount Rudolph are two of the largest cupule sites in the county, one is subterranean, the other includes very deep vertical grooves along cupules which are small cup-shaped depressions ground into the rock or on vertical surface. In my estimation, this is one of the areas we will be looking at as a candidate nomination national registry.

Response: Concur. BLM archaeologists have added these two sites to their inventory. However, these two sites will not be identified in the Final EIS in order to prevent location and possible damage by scavengers and collectors. An analysis of impacts on the increased number of sites has been added in Chapter III.

3. Comment: It is an important area in the Historic Preservation Act of 1966, the act to preserve the character and integrity of a candidate nomination to the national registry of historic places. I believe that bisecting this with two 500 kV transmission lines would seriously deteriorate the character of the important area. The impact might not be direct but I feel that they would be - the indirect impact would be significant. To address further on the impacts of the transmission line in Riverside County, I am concerned to start from the desert end. I am concerned about the impacts on Camp Young which is a general camp northeast of the desert center. There are already additional transmission lines approximately -- I believe one is two miles north which are visible from the site and I can only feel that additional transmission lines would add to the visual impacts of this site.

Response: Until an authorized agency nominates a site, it cannot receive the benefits of such a nomination. The visual impacts of the proposed transmission line are discussed in Chapters III and V as they relate to recreational and historic sites.

4. Comment: I think also, this site in Riverside County is a candidate for nomination to the national registry, although part of these belong to the Bureau of Land Management at Riverside indicate it has not -- the action has not been taken to so nominate it.

Response: See response to previous Comment No. 3.

5. Comment: Once again adding to the number of transmission lines that sweep along the south end of Joshua Tree National Monument while there are existing line there, there is an area immediately to the east of the Hayfield pumping station called the Hayfield Canyon area which is on the caliber of nomination to the national registry and I believe the people of Joshua Tree National

Monument have completed their rock art inventory and may be submitting this as a registry nomination or maybe then by outside groups since it is not a monument, right on the border of a monument. I know that the Sierra Club looked at the area for possible inclusion in an extension of the wilderness for Joshua Tree National Monument. Bringing the individual that has already spoken to the additional impact, these lines will increase in the Pass area. I won't speak to that. There are no archaeological resources in Ram Canyon. Ram Canyon is also a significant natural area for the county to the best of my recollection. There are no existing power lines there just as there are no existing power lines in the Lakeview Mountains.

Response: BLM archaeological scientists have added this information to their inventories. It will not be made public to prevent location and possible vandalism by collectors and scavengers. Therefore, a change in the Final EIS was not made. See response to previous Comment No. 3.

6. Comment: Coming down from Ram Canyon across the San Jacinto River, I have already spoken of an abundance of prehistoric art along the north and west sides of the lakeview Mountains. It is a very important area. In addition to the prehistoric art as you might expect, there are large village sites. There are excesses of 100 bed rock mortars some of which exceed 12 inches in diameter and depth. This is an extensive mission area, some of which have been impacted by the aqueduct through a certain extent by putting transmission lines across that area would just serve as a cruise across to the carrying integrity of the area.

Response: See response to previous Comment No. 3.

7. Comment: As far as the California desert itself goes, the San Bernardino portion of the desert, I would question the need to separate these transmission

lines by 2,000 feet. I understand that need is justified on the basis of power outages I believe that the downing of transmission lines is justified on that basis. I really wonder what we are going to end up with here if we have a programmatic overview of this thing if we aren't going to end up with several miles wide corridors down through the California desert.

Response: The participants state that a 2,000 foot spacing between transmission lines is needed. An alternative of reduced transmission line spacing is presented in Chapter VIII.

8. Comment: I really wonder what we are going to end up with here if we have a programmatic overview of this thing if we aren't going to end up with several miles wide corridors down through the California desert and even though they may not be directly impacted, very important prehistoric remains in the San Bernardino County portion of the desert, I think once the Kaiparowits goes in, others will follow. And the cumulative impacts have not been adequately addressed in the EIS for that or air quality up in Kanab. We need a programmatic EIS. We are looking at -- turning Southern Utah into an industrial park.

Response: The historic remains in San Bernardino County have now been added to the inventory being assembled by BLM archaeologists. It is not certain that other proposed power plants will follow Kaiparowits or even that the Kaiparowits plant will be constructed. The air quality of the plant site impact area is discussed in detail in the Final EIS.

A. Johnson - San Bernardino, California

1. Comment: However, the report in their impact carries about 35 years beyond the finish of construction in 1983 or about 42 years in the future and then is dropped. It only alludes very meagerly to what happens to it by the impact on this region. After the plant supposedly is shut down after its 35

years of usefulness, what happens to the landscape by this ghost town or industrial complex?

Response: It has been assumed that the power plant would be in operation for at least 50 years, whereas the amortization life would be 35 years. The facilities probably would remain on the site after abandonment, unless state or county laws are enacted in the meantime to require removal as the land occupied would no longer be federally owned, but privately owned. The new community would then probably experience an economic downturn initially but there is the possibility of increased coal mining after the power plant is abandoned.

2. Comment: What is the impact on the environment by 28 square miles of the Kaiparowits plateau then will be subsided because the coal has been removed from under it? That long range of the geology can have considerable long lasting impacts.

Response: The text has been revised. In summary, the area of potential influence from mining would be 7 miles by 9 miles or 63 square miles based on a more detailed later proposal by the participants. The degree of subsidence as to lateral and vertical extents cannot be determined accurately. Many factors such as amount of overburden, number and aggregate thickness of coal beds mined, separation between beds and method of mining would govern the process. It is felt, however, that subsidence would be generally uniform and not readily noticeable. The vertical degree of subsidence would not equal the thickness of material extracted.

3. Comment: Also what will be the long range results of the impact by the recreation use of the 30,000 square miles that is expected to be impacted by recreational or vehicle use and whatnot of the area?

Response: We have identified the impacts in Chapters III and V (i.e. destruction of vegetation, and antiquities, marring of historic values, destruction

of signs, fences or private property, illegal shooting of wildlife, littering, illegal removal of collectable items such as petrified wood, minerals, fossil remains, etc.). However, we were unable to quantify the magnitude of these impacts.

4. Comment: The population of Southern California is going to be limited not by power but by water and we are fast approaching that limit right now. So that the projection of 5 to 7 percent carried and extrapolated in depth into the future is an unrealistic estimate of what will be needed and we feel that there should be a reassessment as pointed out by previous witnesses here today that the rate of growth is questioned.

Response: Refer to response to Rudolph's Comment No. 6.

C. Bell - San Bernardino, California

1. Comment: Through a cursory review of the EIS, we feel the document adequately assesses many of the impacts, but that it does not deal with the particular proposal from a regional land use planning position. The plan could well result in the insufficient commitment of resources in Utah, Nevada, Arizona, and California. It is quite obvious that the project as proposed will conflict with the established land uses of the area's parks, monuments, national forests, et cetera.

Response: No specific land use plan exists for the region comprising Utah, Nevada, Arizona, and California. Impacts on existing land use that would result from the proposed project are discussed in Chapter III of the Draft and Final statements, particularly in the sections on Land-uses, Industries and Transportation and Recreation Resources.

2. Comment: The Draft EIS should assess the plant's net output derived at the terminal point relative to the unusual amount of resources committed to it.

The 'alternatives' should be expanded to include all other sources of power on various sites throughout the region, in particular -- in Southern California where the majority of the user market exists.

Response: Refer to response to Beard's Comment No. 4. The alternatives section in Chapter VIII of the Final EIS has been expanded to include several kinds of power production.

O. Fast Wolf - Riverside, California

Comment: I feel personally that the statement that you gentlemen are preparing is insufficient because there has been no impact study begun in regards to Indian people and yet it's Indian land they are talking about.

Response: During the preparation of the Draft EIS the BLM consulted with the concerned BIA offices and Indian representatives. Since the greatest impact was upon the Navajo lands, the Navajo Tribe was consulted to a greater extent than other native American tribes.

R. McDonnell - Riverside, California

1. Comment: It's been alluded to before but I would like to mention it. The first one I haven't heard anyone mention. Maybe I just missed it. Maybe it doesn't bear but it seems like I was not reading about the combined effects of all the plants in the area. I was just reading about the effects of the Kaiparowits plant. Maybe the others don't need to be in there for some reason but that may be an omission. I was sort of looking for that and didn't find it anyway.

Response: See responses to Rudolph's Comment No. 7 and Janke's Comment No. 2. Chapter VI discusses the cumulative air quality impact to the extent that data is available. Also, see the Interrelationship section of Chapter I.

2. Comment: Also in the Impact Draft Statement, like has been mentioned, I couldn't find too much about the energy conservation alternatives. I did find

something about if we adopt energy conservation now we can defer the plant for ten years or if we adopt energy conservation five years from now we can perhaps defer construction for five years. So this was in there. I don't know if it meant from the date of the statement, which was a little bit ago, but I didn't really see anything about the energy conservation alternative...

...I don't know what the highest use of this resource is but it may not be to burn coal as has just been mentioned. It may be utilizing the coal and chemical plants for fertilizer. This may be a much higher use. The small percentage will be for the life of this project but still five-tenths percent of what is there can be very significant.

Response: The section on energy conservation alternatives has been expanded, with additional text and references in the FES. Also see response to Coles' Comment No. 4.

3. Comment: So I would like to see - I got to say this one thing once again then - I would like to see more facts and figures or at least judgments if possible in the Environmental Impact Statement as to what are the alternatives if we don't have this. Where can we go? Is it going to be good or bad in somebody's judgment? Of course, this is difficult to do I realize but it seems I can't get a handle on this whole thing if I don't have the alternatives to clearly spell it out for me.

Response: The Environmental Impact Statement is intended to present facts on which to base a decision. However, it is not the only document used in arriving at a decision. The discussion on alternatives has been expanded in the Final EIS.

J. Shaw - Riverside, California

Comment: In this connection we were asked by the county to review the EIS

on the Kaiparowits project. The committee found that the EIS as submitted, which covered the area of Silverado and Black Star Canyons, has been unacceptable in that the maps presented were reduced to a 9 x 11 size and a felt pen had been used to draw a line showing the route of the proposed line. Now a felt pen line on a map of this size covers a mile of territory so that it was impossible to determine where the line was actually going.

Response: The participants proposal stated that until a final survey is completed a corridor one mile wide is being considered. Consequently, the transmission line could be located anywhere within the black line. Also, because this project would cross four states, it was not reasonable to use larger scale maps to show the proposed transmission lines.

R. Marting - Riverside, California

Comment: We have something there in Morongo Valley that most of the gentlemen here probably never heard of. Morongo Valley is the wildlife sanctuary. According to all the universities -- and I could tell you of a jillion universities in the last five years that have used the wildlife sanctuary. It's one of the only ones left in the United States of America. The only other one that comes close is in North Carolina where you can study the life habitat of birds. But this is an oasis.

Response: Concur. This information has been included in the Sheephole Pass and Bristol Mountains alternates (Chapter VIII).

J. Laprevote - Riverside, California

1. Comment: Also someone here before brought up the issue of mercury. That was also in the report and in the report it said that there was a possibility that the additional mercury emissions from this plant might make fishing in

Lake Powell useless. I am wondering if the power, if the justification for this plant, takes any consideration. Is ruining Lake Powell worth it for 3,000 megawatts of power whose justification is in question?

As far as the air emissions of this plant, I could go on for quite a while but I will make it quite brief. Your own department, the Department of Interior, stated that the added effects of emissions from power plants could be expected if they were spaced closer than 50 miles and that Kaiparowits plant is only 36 miles from the Navajo plant. I couldn't find anything in the report that dealt with the added effects of these two plants.

Response: See responses to Sleight's Comment No. 4 and Crall's Comment No. 1. The potential plume interaction of the Navajo power plant and the proposed Kaiparowits power plant is discussed in Chapter VI of the Final Statement. See response to Williams' Comment No. 5.

2. Comment: Also I would like to address myself to the problem I understand that - it is a fact that an Environmental Impact Study has just about come out on the proposed wilderness area for Glen Canyon in the recreation area at Lake Powell. It seems to me that the conservation proposal for this which would include a large amount of wilderness is going to be approved through Congress. It looks clear that there doesn't seem to be any major opposition. I am wondering, this plant is only 16 miles from Glen Canyon. What effect is this going to have on the wilderness qualities of this area? I couldn't find anything at all in the report about this.

Response: In the Draft Statement, the area around Lake Powell was recognized as having "high potential for primitive management" page II-294. Impacts on "....solitude in nearby canyons and bays" are discussed on Page III-235 and impacts of ORV use on the "southern portion of Glen Canyon National Recreation Area" are discussed on Page III-237. The Final Statement was expanded to

identify the Glen Canyon NRA as being one of three areas where the "primitive values" would be heavily impacted.

3. Comment: Also there was some thought given to the damage to agricultural operations downstream. The plant - in the report it said there would be about 200,000 per a certain unit of added salts in the Colorado and I calculated this to \$20-million, over the period of the plant, damage to agricultural operations downstream. I just suppose to the American Border. I don't think that includes Mexico.

Response: Chapter III of the EIS has been revised to explain the purpose of the Colorado River Salinity Control Act and the Colorado River Water Quality Improvement Program.

4. Comment: Also, I would like to know - I would like to see more research into the possibilities of what's known as MHD generation, magnetohydrodynamics, which has a much higher efficiency than the present system of converting the coal directly to heat and then to heat water and then run the turbine.

Response: A good basic discussion of the state of the art of magnetohydrodynamics is given in Energy Alternatives: A Comparative Analysis, published by the U.S. Government Printing Office, Washington, May 1975, Section 12.6, p. 12-33, et seq.

C. Randolph - Riverside, California

1. Comment: Secondly, I don't think there was sufficient power - there was insufficient information in the Environmental Impact report on the alternate approaches in the Silverado Canyon area.

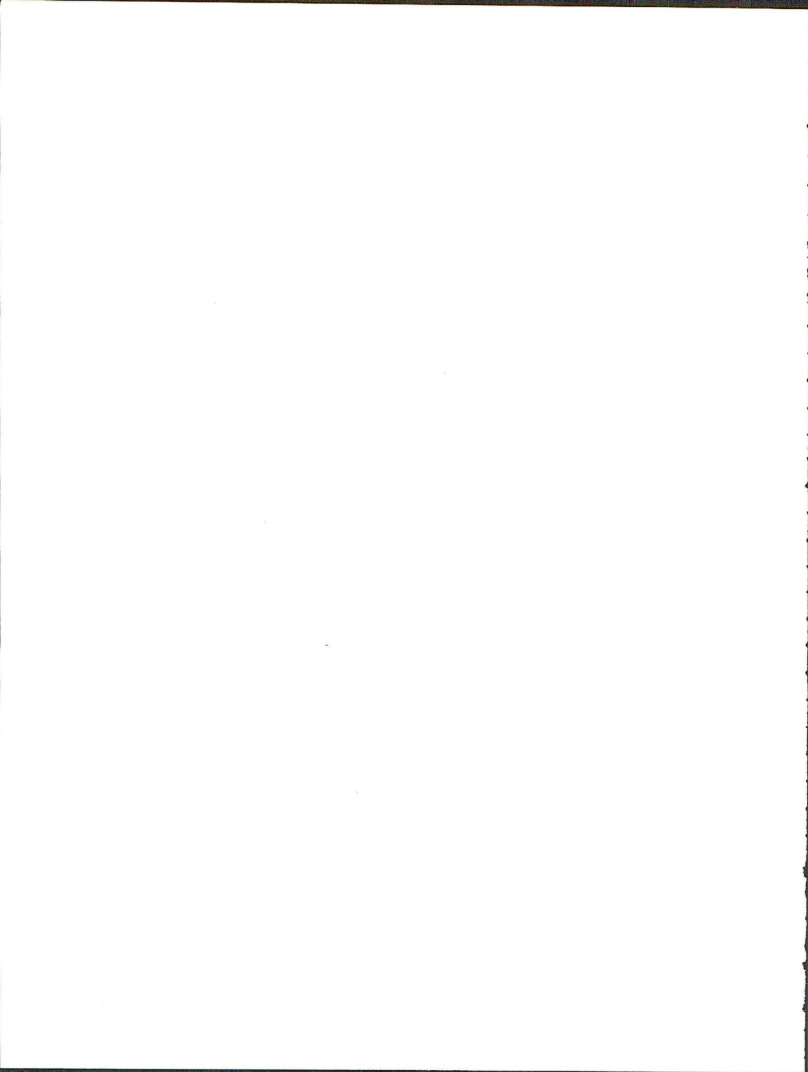
Response: The segment of the Devers-Serrano alternate that goes around the Santa Ana Mountains avoids Silverado Canyon.

2. Comment: Secondly, I don't think that there was a detailed enough map unless there is a plan to acquire right-of-way as wide as the line on the map which is about one mile wide.

Response: See response to Shaw's Comment No. 1.

3. Comment: And last I guess it's probably not practical and I didn't have time to look in detail at the report since I didn't find out about it soon enough, but I think that it should be defined in detail as to alternates of underground lines in certain areas and immediately I guess the thought is you can't have high voltage lines underground.

Response: This is discussed in Chapter VIII (Underground alternate) of the Draft and Final EIS.



Major comment letters received

<u>Letter Number</u>	<u>Agency, Organization or Individual</u>	<u>Page Number</u>
1.	State of Utah, Dept. of Development Services, Division of State History	
2.	U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration	
3.	Federal Energy Administration	
4.	U.S. Dept. of Agriculture, Forest Service, Cleveland National Forest	
5.	Governor's Commission on Arizona Environment	
6.	Richard A. Marston	
7.	U.S. Dept. of Transportation, Federal Highway Administration	
8.	Southeastern Colorado Wilderness Coalition	
9.	Sierra Club, North Dakota Group	
10.	New Mexico Wilderness Study Committee	
11.	Advisory Council on Historic Preservation	
12.	Wyoming-Utah-Nevada Chapter, Outdoors Unlimited	
13.	Utah Manufacturers Association	
14.	Operating Engineers Local Union No. 3 of the International Union of Operating Engineers	
15.	Scott Bailey	
16.	City of Banning, City Manager	
17.	Utah Mining Association	
18.	State of Arizona Oil and Gas Conservation Commission	
19.	Environmental Task Force	
20.	Mildred and Carl Ehrman	
21.	U.S. Dept. of Transportation, Federal Aviation Administration	
22.	City of Banning, Chief Building Inspector	

<u>Letter Number</u>	<u>Agency, Organization or Individual</u>	<u>Page Number</u>
23.	Rocky Mountain Federation of Mineralogical Societies	
24.	Robert G. Bear	
25.	State of Utah, Dept. of Development Services, Div. of State History	
26.	U.S. Dept. of Housing and Urban Development	
27.	Lake Powell Research Project	
28.	National Parks and Conservation Association	
29.	Richard L. Casperson	
30.	Arizona Audubon Council	
31.	Alice T. Anderson	
32.	James S. Davison	
33.	Northern Arizona Council of Governments	
34.	U.S. Dept. of the Interior, Bureau of Indian Affairs	
35.	Robert Kvaas	
36.	Boulder Audubon Society	
37.	U.S. Dept. of the Interior, Bonneville Power Administration	
38.	Clark County Regional Planning Council	
39.	Bridgerland Audubon Society	
40.	The Cactus & Succulent Society of America	
41.	Northern Arizona University, Department of Biological Sciences	
42.	Arizona State Clearinghouse	
43.	Arizona Archaeological Society	
44.	Robert H. Thompson	
45.	Plateau Sciences Society	
46.	Arizona Wildlife Federation	
47.	U.S. Dept. of the Interior, Bonneville Power Administration	

<u>Letter Number</u>	<u>Agency, Organization or Individual</u>	<u>Page Number</u>
48.	Mineralogical Society of Utah	
49.	Jeffrey L. Dawson	
50.	Mary Anne Mark	
51.	U.S. Dept. of the Interior, National Park Service	
52.	Dept. of the Army, Corps of Engineers	
53.	El Paso Natural Gas Company	
54.	U.S. Dept. of the Interior, Mining Enforcement and Safety Administration	
55.	Western Municipal Water District of Riverside County	
56.	Arizona Game & Fish Department	
57.	Arizona Lung Association	
58.	U.S. Dept. of Commerce, The Assistant Secretary for Science & Technology	
59.	Southern California Association of Governments	
60.	Arizona Mining Association	
61.	Corona Chamber of Commerce	
62.	U.S. Dept. of Transportation, Federal Highway Administration	
63.	U.S. Dept. of Transportation, Federal Aviation Administration	
64.	The Cactus & Succulent Society of America	
65.	Rocky Mountain Federation of Mineralogical Societies	
66.	U.S. Dept. of the Interior, Bureau of Reclamation	
67.	State of Nevada	
68.	County of San Bernardino	
69.	U.S. Dept. of the Interior, Fish & Wildlife Service	
70.	The Maricopa Audubon Society	
71.	Real People Press	

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| 72. | Colorado Open Space Council | |
| 73. | National Audubon Society | |
| 74. | Douglas W. Steeples | |
| 75. | Tennessee Valley Authority | |
| 76. | Richard W. Shanteau | |
| 77. | Governor's Commission on Arizona Environment | |
| 78. | Arizona Wildlife Federation | |
| 79. | Sierra Club, San Diego Chapter | |
| 80. | R. Fenten Rood | |
| 81. | Jack T. Spence | |
| 82. | Arizona Dept. of Transportation | |
| 83. | Utah Wildlife & Outdoor Recreation Federation | |
| 84. | Samuel M. Tucker | |
| 85. | Garfield County Commissioners | |
| 86. | Coconino-Navajo Counties Central Labor Council | |
| 87. | Local Union No. 184, United Brotherhood of Carpenters
and Joiners of America | |
| 88. | Utah Chapter - Associated General Contractors | |
| 89. | Marga Raskin | |
| 90. | Ben Wood | |
| 91. | Delbert Wiens | |
| 92. | University of Utah Research Institute | |
| 93. | Arizona Wildlife Federation | |

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94.	Irmgard Hunt	
95.	Mrs. Howard Allen	
96.	Susan and Craig B. Taylor; Mary J. Blomfield, James Manning	
97.	Wilderness Workshop of COSC	
98.	Steve Tackabery	
99.	Kane County Board of Commissioners	
100.	Kim R. Wickhold	
101.	Tucson Audubon Society	
102.	William J. Lockhart	
103.	The Committee of Concern for the Traditional Indian (CC/TI)	
104.	Utah Clear	
105.	Sierra Club, Southern California Regional Conservation Committee	
106.	Arizona Desert Bighorn Sheep Society, Inc.	
107.	League of Women Voters of Arizona	
108.	Sierra Club, Uinta Chapter	
109.	U.S. Dept. of the Interior, Geological Survey	
110.	Northern Arizona Council of Governments	
111.	George R. Barker	
112.	Nevada Power Company	
113.	Friends of the Earth, Inc.	
114.	Environmental Defense Fund	
115.	Timothy E. Wirth	
116.	ISSUE	
117.	Southwest Powerplant Information Center	
118.	Steven J. Manning and Elna R. Manning	

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119.	Tom Wright
120.	Utah Environment Center
121.	Canyonlands Environmental Education Center
122.	Utah Commission for Ministry in Higher Education
123.	Utah Association of Counties
124.	Federation of Western Outdoor Clubs
125.	Four Corners Wilderness Workshop
126.	Nancy Strong
127.	U.S. Dept. of Health, Education and Welfare
128.	County of Orange
129.	County of Riverside
130.	Sun City Civic Association
131.	U.S. Environmental Protection Agency
132.	Morongo Basin Conservation Association
133.	Robert Haspel
134.	Dr. Claron E. Nelson
135.	William Gallagher
136.	Operating Engineers, Joint Apprenticeship Committee
137.	Jim Ferrel
138.	Blanche Clegg
139.	Department of Employment Security, Panguitch, Utah
140.	Peter Hovingh (Escalante Wilderness Committee)
141.	Western River Guides Association, Inc.
142.	Metropolitan Water District of Salt Lake City
143.	National Campers and Hikers Association
144.	The Desert Protective Council, Inc.
145.	Nicholas S. Van Pelt

Written comments and responses

1. State of Utah, Dept. of Development Services, Division of State History

(1) Comment: It is my impression that the purpose of impact statements is to provide a study of alternatives. Needs and impacts of these alternatives can then be assessed and a choice made as to which alternative would be best. However, the archeological studies conducted as a part of this statement do not adequately discuss alternatives.

a) Only 10 percent of the impact area was studied; the plant site survey is "not complete;" "most" of the transmission corridors were not surveyed. Given this limited data, it is virtually impossible to adequately assess alternatives, particularly alternate transmission corridors.

b) In the absence of data, so-called "probability models" are provided. These are inadequate in my estimation for making any final decisions.

Response: Studies were completed for the above alternatives and are discussed in Chapter VIII.

Intensive studies or surveys for the total project area and alternatives would provide a thorough analysis but would be very costly. NEPA requires that sufficient data be obtained to adequately evaluate resources in areas of impact, including alternatives. We feel that the studies that were completed were sufficient to analyze such impacts. Intensive surveys would be completed prior to construction.

(2) Comment: It is stressed that both direct and indirect impacts on cultural resources will be very high. I must agree. However, the measures that will be taken to mitigate these impacts are unclear. Mitigation measures are not detailed, probably because probable impacts were not adequately studied. While areas of direct impact will be surveyed and sites identified for avoidance or salvage if necessary, mitigating measures for secondary impacts are not discussed.

No mitigating measures are proposed by participants and it is unclear whether federal agencies' proposed mitigating measures will be accomplished prior to turning control over to participants.

Response: To the extent possible, secondary impacts have been discussed in Chapter III and appropriate mitigating measures defined in Chapter IV. The participants will have their right-of-way grants prior to accomplishing all mitigation, but there will be federal agency surveillance for compliance, with right-of-way grant withdrawal and total work stoppage possible if needed.

(3) Comment: I feel that the Kaiparowits project will eventually be used as a guide for numerous other similar projects in Utah, and as such I am being somewhat critical. I am aware that much detailed work, particularly archeological research, has gone into the preparation of this statement. However, I feel it is inadequate for the assessment of possible damage to archeological sites. Above all I am concerned with the secondary impacts. There is enough legislation presently to assure that direct impacts on cultural resources will be adequately handled. However, the newly opened access route to previously inaccessible areas and the influx of workers and visitors will result in the destruction of literally thousands of archeological sites in the project area. I suggest that in the final statement measures to identify resources in secondary impact areas and measures to protect these resources be discussed.

Response: See response to previous Comment No. 2. Cultural resources, subject to indirect or secondary impacts must be primarily the responsibility of the managing federal agency.

2. U.S. Dept. of Commerce, National Oceanic and Atmospheric Administration

(1) Comment: p. II-29, lines 14-15.

The term "air pollution potential" is usually considered to be an appropriate meteorological measurement such as the criteria for "stagnation

conditions". We would suggest omission of the phrase "can be interpreted as an air pollution potential and".

Response: Concur. The text has been revised.

- (2) Comment: p. II-30, line 5

Unofficially, influence of the Navajo Plant is known as a result of the 1974-75 fall and winter SO₂ measurement program. Highest 3-hr. concentrations were found on Vermillion Cliffs and Leche Rock, although these did not exceed standards when prorated to the eventual operation of 3 units. Nevertheless, it does indicate the importance of the interaction (impingement?) of the plume and high terrain. We would suggest contact with the Navajo Plant operators (Salt River Project) to obtain their results.

Response: Concur. The results of the SO₂ measurement program have been obtained and utilized in the Final Statement.

- (3) Comment: p. II-43, 10th line from bottom

Reference should be 1972.

Response: Concur. The text has been revised.

- (4) Comment: p. III-21, Section 3

On what basis (visible tracer, quantitative plume concentration measurements?) was it concluded that the plume cleared the Straight Cliffs? From the Vermillion Cliffs results we would conclude differently.

Response: Concur. The text has been revised.

- (5) Comment: p. III-23, Suggest use of metric system throughout table.

p. III-38, line 9 typo - mechanical-draft.

p. VIII-248, line 9 from bottom -15°F

Response: Concur. The text has been corrected and revised.

3. Federal Energy Administration

No response required.

4. U.S. Dept. of Agriculture, Forest Service, Cleveland National Forest

(1) Comment: Illustration 39 (Page I-161) shows a proposed microwave site on Santiago Peak (Santiago Peak is shown in the wrong location - it is inside in Cleveland Forest Boundary). However, on Page I-166 (Figure 30) the table shows Santiago Peak as an "existing microwave station, no expansion." Needs to be clarified and the correct location shown.

Response: Concur. The illustration and text have been revised.

5. Governor's Commission on Arizona Environment

(1) Comment: The use of helicopters to install towers is highly commendable. The necessity for access roads for all towers is questionable. Use of tracked vehicles could eliminate many such roads (see information on Tucson Gas & Electric line from Farmington, New Mexico to Vail, Arizona). Restoration is simplified if impact is eliminated or reduced greatly.

Response: We agree that the use of helicopters to install transmission line towers in areas of high resource value should reduce the impacts on the environment in these areas. The use of tracked vehicles rather than rubber-tired vehicles would reduce the impacts on the environment, but not eliminate the impacts entirely. This discussion has been added to Chapter III in the FES. Mitigating measures are provided for under BLM bonding requirements as listed in Chapter IV of the Draft EIS.

6. Richard A. Marston

(1) Comment: The Errata Sheet for Chapter 1 states that the Salt River Project notified Arizona Public Service Company, San Diego Gas and Electric

Company, and Southern California Edison Company that they were terminating their participation in the Kaiparowits Project. There are no further comments on why they withdrew. Was it because of the extremely high cost of the electricity to be produced from Kaiparowits, or did they withdraw because of the enormous environmental impacts? At any rate, the Salt River Project had a 10% interest in the power output such that there is now 18% (!) of Kaiparowits produced electricity that is unallocated. The disposition of this 18% will reenforce and redirect impacts outside of the project area. With the three remaining participants receiving the excess allotment, what will be the additional impacts in their respective service areas? The increased energy supply may likely be met with an increased demand as is often the case. Conservation efforts may be relaxed... and the spiral of energy digestion continues. Other impacts will be suspended, such as the construction of a 500 kv transmission line to the Salt River Project Service Area. The ultimate result of Salt River's refusal to participate in the Kaiparowits Project is that the distribution of market area impacts has been changed from those stated in the EIS.

Response: The unallocated power would not go to the participants but would be put up for commercial bid. We are not aware of the reasons why Salt River Project withdrew.

(2) Comment: (pp. I-4, I-5) The Bureau of Land Management (BLM) has offered to supply a written summary of the Kaiparowits Project to all those who wish to review the EIS but who cannot spend the time to go through 5 volumes containing 2,323 pages. What they will receive is an over-generalized, brief statement with a void of substantial material with which to critically analyze the project. The first instance of this oversight is evident in the description of water needs by the Kaiparowits generating station. It would be helpful to know right away what proportion of Utah's allotment to Colorado River water is

taken by the 41,400 acre-feet consumed per year by the plant. Next, one reads where the mines would provide 12 million tons per year of coal to the plant...but earlier the summary states: "The generating station would consume approximately 9,000,000 tons of washed coal each year...". What happened to the other 3 million tons?? Not until later does one find that the 3 million tons will be LOST in the washing process... 25% of the mined coal will be lost, irretrievable, irreversable.

Response: Concur. The text of the summary and Final EIS has been revised.

(3) Comment: (p. I-7) Illustration 2 is the first of many poor illustrations which inhibit any effective communication between the authors of the EIS and the public. The cartographers shouldn't have used the U.S.G.S. topographic map for their mylar base map.

Response: Concur. This illustration has been revised.

(4) Comment: (p. I-9) The difference between the legend entries for Illustration 3 is so indefinite that one cannot read the map.

Response: Concur. This illustration has been revised.

(5) Comment: (p. I-13) Why is there no listing for the quantity of coal consumed under the listing for Power Plant?

Response: Concur. This figure has been revised.

(6) Comment: (p. 12) Upon the first mention of the new townsite on East Clark Bench on Highway 89, one must guess if this is the existing site of Glen Canyon City which is best described by broken down brick walls, gutted roads, and a lack of any identity to say the least...obviously the best choice for a new town...or is it?

Response: The referenced page is in the summary of Chapter I. The full text describes the proposed town site in greater detail. The revised proposal, described in the final Statement, describes land at the west edge of Glen Canyon City. The Final Statement assesses the impacts of proposed actions; it does not evaluate the validity of choices made by proponents of the proposals.

(7) Comment: (pp. I-19, I-25, I-28, I-35) On each of these four figures, only one curve is shown representing the utilities projected per capita energy consumption. What happens if the rating structure is changed or if more stringent conservation measures are established? The methods utilized for projecting energy demands are never fully explained such that a critical review can be made. On page I-35, the curve for projected per capita energy demand drawn by Southern California Edison, a sudden and sharp rise is shown after 1977. No explanation is given for this extreme change in consumption.

Response: One independent demand forecast has been added to Chapter I of the final EIS. This forecast states that the projected power consumption is expected to decrease in the future.

(8) Comment: (p. I-40) The EIS goes on to admit that independent predictions of future energy demand would be useful in assessing the need for new generating facilities, but that no such projections have been made for the Kaiparowits market area. This is a serious void. Can we be led to believe the utilities outright with their own projections?

Response: Refer to previous comment.

(9) Comment: (p. I-41) The EIS admits here that deviations from the projected demand curves might ensue under several conditions. So why aren't these changes incorporated into alternative curves instead of showing just one curve which illustrates maximum demand? On the same page, under the section concerning

the rationale for construction, the EIS begins by exclaiming, "Electric power demand is increasing." The author's insight here is overwhelming, but no amount of support for this statement can defer the argument that this statement alone is enough to justify the project.

Response: See response to Rudolph's Comment No. 6, hearing section.

(10) Comment: (p. I-42) On Figure 19, what is the axis on the right side of the graph supposed to show? A very confusing graph.

Response: Concur. This figure has been deleted from the Final Statement.

(11) Comment: (I-54) The EIS claims next that "A mudstone lining one foot thick would be provided to prevent degradation of ground water" for the retention basins. This layer would be quickly denuded by summer thunderstorm runoff and raindrop splash would destroy the soil aggregates. Even if supplementary materials are added over the mud lining, long-term seepage would increase.

Response: Concur. Although the present proposal now calls for a 2-foot thick mudstone liner, there would still be some seepage (estimated maximum, about 22 acre-feet per year). The potential impact of this seepage loss on local water sources, and the potential long-term impacts of the contents of the evaporation ponds on water quality are addressed in the Water Resources sections of Chapters III and V of the Final EIS.

(12) Comment: (I-63) In addition to the by-products of burning coal mentioned in the EIS (CO_2 , water, SO_2 , NO_x , and ash), CO (carbon monoxide) would be expected as a common product of burning fossil fuels.

Response: CO (carbon monoxide) is not expected to be produced due to the high heat and complete combustion of the coal.

(13) Comment: (p. I-68) The use of Ringelmann charts is questionable at best with regard to accuracy.

Response: The inadequacies of the Ringelmann Chart have been recognized for some time. Despite these widely known problems, enforcement of plume opacity limitations using the Ringelmann Chart has proved acceptable. EPA describes the use of the technique in Standards of Performance for New Stationary Sources, Method 9: Visual Determination of the Opacity of Emissions from Stationary Sources. The State of Utah also recognizes the use of the technique as acceptable.

Although the use of the Ringelmann Chart is questionable, it is the only means presently available for evaluating visibility.

(14) Comment: (p. I-79) The EIS states that the ash recovered for disposal would be similar to a silty soil material, but it doesn't say how it will be similar...certainly not chemically. This is just one of innumerable editing oversights.

Response: The Final Statement has been revised to say "similar in engineering quality."

(15) Comment: (p. I-83) The EIS uses the term "mortar-like crust" to describe the ash-scrubber sludge mixture. This is not a term found in any soil science textbook glossary. Another vague term...

Response: The referred to term "mortar-like crust" is not meant to be a soils term. It is simply saying the ash-scrubber sludge mix would be "brick hard."

(16) Comment: (p. I-84) While the waste materials for the disposal ponds are at least identified, have any feasibility studies in the field been conducted for revegetation species? This is not indicated.

Response: We are not aware of any revegetation studies using this material as a growing medium.

(17) Comment: (p. I-85) Although the Bureau of Reclamation has allocated up to 102,000 acre-feet of water per year to the participants, only 50,000 would be consumed with no pending proposals for the remaining 52,000 acre-feet. What is the purpose of authorizing such a large amount of water for purposes unknown to the public, to the Government, and apparently to the utilities? How can impacts on quantity and quality of returned water to Lake Powell be measured or predicted?

Response: The State of Utah has authorized use of these amounts of water through a water service contract. The participants have not identified their use of the water beyond what is discussed in Chapter I.

There would be no return of project water to Lake Powell. This is mentioned in the surface water section of Chapter III of the final EIS. The impacts of withdrawing and depleting the 50,000 acre-feet of water from Lake Powell on Colorado River salinity are also addressed in that section.

(18) Comment: (p. I-89) The EIS states: "If the lake elevation should drop low enough so that fish could be taken in, fish screens would be installed in the intake." This reference to the water intake tunnel to Lake Powell ignores the fact that a monitoring station would have to be established to detect fish intake. Why not simply install the fish screens when the system is first installed?

Response: The applicant did not propose to install a permanent fish screen; therefore, it was not mentioned in Chapter I. There is no satisfactory way to keep a permanent fish screen free of debris at a depth of 200 feet. The applicant has proposed to install a fish screen if loss of fish becomes a problem during periods of low water. This would be technically feasible but would probably require floating facilities in conflict with management objectives for

Lake Powell National Recreation Area. Therefore, fish losses at the water intake were considered as an unavoidable impact and listed as such in Chapter V.

To place the problem in perspective, it should be remembered that the water intake is a single point in a reservoir approximately 150 miles long fish are routinely lost through generating turbines at the dam.

(19) Comment: (p. I-96) The EIS does not explain why wet cooling towers were chosen for the project. Another may be more expensive but may save water otherwise consumed.

Response: A comparison of various types of cooling towers is presented in Chapter VIII.

(20) Comment: (p. I-114) The EIS claims that measurements of air quality elements taken "in the general area /emphasis added/ of the proposed Kaiparowits Generating Station" such that this data could be used to determine baseline levels of parameters for the Fourmile Bench site. This data was taken for the Navajo Project which experiences different localized wind systems and particulate source areas, all of which questions the cross-referencing of data.

Response: Air quality data from Page, Arizona were used as an approximation of air quality to be found at Nipple Bench and Fourmile Bench in the absence of data actually obtained on those sites. Page, Arizona is within approximately 30 miles of the farthest proposed site and 2,000 feet lower in elevation. Although some differences would be expected between the two locations because of lack of industrial activity before the Navajo plant came on line, low population, and relative remoteness, these differences should be insignificant. This is no longer the case, however, as indicated in the Final EIS. The Navajo plant has influenced the SO₂ and NO_x concentrations in the Page area.

(21) Comment: (p. I-115) The EIS states that data from the baseline studies "would be used in planning, design and implementation of post-operative biological programs for measuring, detecting and determining potential or actual effects in areas determined to be most sensitive or ecologically critical." This expresses a good intention, but is very unspecific with regard to the monitoring program set-up. Who determines the "ecologically critical areas?" What will be measured? How often? How can anyone be expected to critique such claims by the EIS without sufficient information?

Response: A copy of the water service contract between the applicant and the Department of the Interior was included in the reference material beginning on page A-190 of the Draft EIS. This document lists a number of stipulations regarding maintenance of air and water quality. Noncompliance by the applicant could cause cancellation of the water service contract.

Page 5, Chapter IV of the draft states:

"The assumption in this chapter is that participants would act in good faith by implementing the measures they have proposed and in complying with applicable statutes and regulations. Should this not be the case, however, or should the measures fail, the results would be as described in Chapters III and V as 'worst case' impacts."

Chapter II identifies critical areas. What will be measured, how often, and who will do the measuring has not been determined at this time.

(22) Comment: (p. I-130) A statement on this page reports that only 50% of the minable coal would be recovered, a percentage not alluded to earlier. This is extremely high and a great irretrievable loss.

Response: The text has been expanded in Chapter I to further discuss coal recovery methods, percentages, etc.

(23) Comment: (p. I-132) The EIS claims that areas which have to be protected from subsidence will experience only partial extraction mining methods. The question arises...whose criteria will be used to delineate those areas. One might wonder whether the coal mining operation might tend to see fewer of such areas.

Response: Refer to the revised text in Chapter I of the Final EIS.

(24) Comment: (p. I-153) The EIS says that an oily-waste separator would be used to extract oil to be stored in a separator tank "pending disposal by a vacuum truck in a designated area /emphasis added/." Where might this be?? In Escalante Canyon perhaps? Another missing link in the report.

Response: This "area" has not yet been identified. BLM will direct the dumping of waste oil in a designated, authorized area, i.e., the new town waste disposal area, should the project be approved.

(25) Comment: (pp. I-171 through I-224) These maps of the transmission routes are impossible to read, making a thorough examination of the routes accordingly difficult. Poor, poor graphics mar this entire report.

Response: New maps have been incorporated in the Final EIS.

(26) Comment: (p. I-242) Regarding item (4) under the access road design specifications, a one to one cut slope is usually too steep, but what is "ordinary material"?

Response: This refers to ordinary soil material that will stand a one to one slope, such as clays-loams, etc. This may include common adjacent soils.

(27) Comment: (p. I-310) The EIS claims that the temporary community to be developed for the construction workers "would provide public services equal to those provided for residents of existing communities in the area." We certainly hope that they are not referring to services provided in Glen Canyon City.

Otherwise, a reference to services in Page must be assuming that the conditions found in Page are optimal for residents of the area. Is this in fact true? Moreover, who is to decide if the services to be supplied are adequate?

Response: The socioeconomic section in Chapter III of the FES has been expanded to discuss these concerns. Page could provide services for some of the employees. The temporary community could handle the construction force adequately. Glen Canyon City would provide minimal services. Kanab could provide some services but lacks housing. Under these circumstances, the Kaiparowits Planning and Development Advisory Council is planning a new town which they anticipate will be adequate to meet the needs of all the new residents.

(28) Comment: (p. I-332) With regard to the New Town on East Clark Bench, the EIS states: "The preliminary plan does not identify costs of construction or services, exactly how these needs would be met, the fact that water rights have not been attained, and that withdrawal of subsurface water from the Navajo sandstone, underlying the site, may interfere with bank storage of Lake Powell." These are serious omissions which may have considerable impact, particularly with the potential for dewatering the Navajo sandstone. The increased flow from Lake Powell may inflame existing bank stability problems.

Response: Additional information received from the participants regarding these issues has been added to Chapter I of the Final EIS.

(29) Comment: (p. I-345) Despite the enormous proportions of the Kaiparowits Project, this page in the EIS must suffice for a regional impact statement. With the other power plants located at Page, Four Corners, Huntington, San Juan, Emery, Warner Valley, Mohave, Cholla, Garfield, and others, the potential for a considerable cumulative effect is prevalent. In light of the recent Supreme Court decision requiring a regional environmental impact statement for the Northern Great Plains coal-fired power development, a similar statement should be forthcoming

for the Southwest. The existing Southwest Energy Study might suffice as a description of proposed actions, but the included impacts are not well documented.

Response: See response to Rudolph's Comment No. 7 and Janke's Comment No. 2 in the hearings section.

(30) Comment: (pp. II-9 to II-10) Perhaps the most incomplete, off-the-cuff diatribe of the entire EIS is contained in the four line section titled: "Probable future environment without project (trends)." There is no mention of what impacts would be foregone excepting the statement, "Future environment without industrialization would be much the same as it is today." This ignores some of the trends in land use the EIS reports are occurring throughout the area, particularly with regard to the disappearance of small ranches, and increasing recreational use of the area. There are of course many other factors which could have been mentioned here.

Response: The disappearance of small ranches along with increased recreation has been occurring in this area during the last 20 years and probably will continue as marginal ranching operations are consolidated. This change in land use was not considered as a form of industrialization. Therefore, the text has not been revised.

(31) Comment: (pp. II-67 to II-94) The section describing the existing geology and topography is poorly organized, sections are misplaced, and pertinent information is missing altogether. There is security in not putting one's name on the report for which one is responsible. To begin with, Illustration 10 on page II-71 is another poor effort by the graphics department as range and township coordinates are either hard to find or read in addition to the strange skewness of the map as it is orientated on the page. Several surficial units are missing on the EIS map as compared with a map prepared by the U.S.G.S. in 1973, including Quaternary alluvium, colluvium, and aeolian deposits. In addition, the

EIS map combines the Tropic Shale and Dakota Sandstone into one map unit, a mistake in light of their differing eroding properties. Springs aren't shown; the source of the map information is not shown; no cross-sections accompany the map, and no symbols can be seen which indicate the amount and direction of dip of formation in degrees. The site is not shown on the map which makes back-referencing necessary to see what geologic units the project facilities are located on. The section titles "General" under "Geology and topography" is actually the regional physiography. However, there is little or no mention made of the predominant slope angles, exposures, or percentage of rock outcrops. There is no section on stratigraphy, although this may be attributed in the end to the absence of any written information in the EIS at all. The information is summarized in a chronologic chart, but there is no mention of the depositional environments or relict landforms. Such information is of significance as an historic or scientific resource of the area and will be included in all reasonable geologic reports. Within the text, there is no description of the controls which the various surficial units place on landform development. The age, thickness, and lithology of all mapped units in the site area is not defined in any organized fashion. While structural elements are mentioned by name, incomplete information is presented on the length, trends, attitudes, widths, ages, and types of folding and faulting. With regard to geologic hazards, a section is devoted to seismology and mention is made of flash floods as if these constitute the entire list of hazards. The following factors should have been considered for any discussion of geologic hazards to construction activities: landsliding (falls, slides, flows), avalanching, ground subsidence, and any other subsurface unstable features. They should all be mapped and described in terms of responding to seismic shaking.

Response: The text has been revised, where appropriate.

(32) Comment: (p. II-95) The EIS claims that from the available information on various soil characteristics, it is possible to determine annual estimated sediment yield, probability of seeding success, water absorption rates, and engineering and construction potentials. Wide circles of soil scientists will dispute the first claim and plant ecologists will often question the second claim, but it is impossible to critique the methods utilized in the EIS for nowhere are they precisely defined. Mention is made of sediment yield predictions forwarded by the Pacific Southwest Interagency Study, but this study was an anthology of MANY methods. Which one did the EIS use? Should we guess and take their word as to the accuracy?

Response: Soil characteristics and interpretations are based on the latest Soil Conservation Service methodology, such as classification procedures and engineering capabilities, as well as methodology developed by the Soil and Moisture Branch of the U.S. Geological Survey. See Appendices II-4, II-5, and III-9 in the Reference Material binding.

(33) Comment: (p. II-133 to II-134) When one analyzes the two tables presented on these pages, it is quite noticeable that the participants will allow an higher concentration of arsenic in the groundwater supply (0.05 mg/l) than is recommended by the U.S. Public Health Service (0.01 mg/l)! No explanation is given. Moreover, the following paragraph on page II-134 states that the existing concentrations of dissolved solids, sulfate, lead and chloride in the water sampled exceeds limits recommended by the Health Service for drinking water. Despite this report, the participants go on to say, "In some areas, however, waters containing total dissolved solids and some specific constituents exceeding the limits are used for drinking because of a lack of better water." Is this the plan for the new town on East Clark Bench?

Response: The tabulations referred to show maximum allowable limits of specific constituents in drinking water recommended by the Public Health Service.

Various mitigation measures of the proposed project are intended to reduce or prevent release of toxic trace elements into the hydrologic system.

The water supply for the proposed new town would have to meet requirements of the Utah Division of Health. It is possible that it would require treatment to meet those requirements.

(34) Comment: (p. II-152) Within the EIS sections on groundwater for the Limestone Quarry, there is continual reference to the depth to water table "along the unnamed draw in which the rabbitbrush grows." The specific location is never identified.

Response: Concur. Text has been revised.

(35) Comment: (p. II-159) The EIS presents a table showing the relative ages of pinyon and juniper trees for various size classes, with diameter expressed in inches. Is this the diameter at breast height (DBH)?

Response: The diameter measurement was made at ground level. The table heading has been revised to indicate the method.

(36) Comment: (p. II-182) The EIS states: "The antelope population still centers around the East Clark Bench area and will probably remain so." This sentence implies that the antelope would remain in the East Clark Bench area even after the new town is constructed. Whether the author wished to imply this thought or not is left open to conjecture because of the poor editing.

Response: Chapter II describes the existing environment. Impacts of the proposed new town on the antelope inhabiting East Clark Bench were discussed in Chapter III. The sentence has been rewritten for better clarity.

(37) Comment: (p. II-190) The EIS states rather tongue-in-cheeked: "The bison herd on the Henry Mountains to the northeast of the Kaiparowits Plateau impact area is almost unique /emphasis added/." What criteria is used to determine "almost unique?"

Response: The criteria used is based on the fact that this herd is the only completely unconfined bison herd in the United States outside of Yellowstone National Park. Since the Henry Mountain herd is not the only free-roaming bison herd in the world, these animals are not completely unique. However, since free-roaming bison herds are not encountered with great frequency in the United States, it was felt this herd might be called "almost unique."

(38) Comment: (p. II-296) No definition of "aesthetics" is offered. When one reads through the report, it becomes evident that the authors of the EIS take the meaning to be restricted to the visual environment. Actually, aesthetics encompass human perception of the total environment such that the visual setting is tempered by sounds, taste, touch, and smell. Cultural as well as natural features comprise the list of aesthetic resources.

Response: The aesthetic section is oriented toward visual environment and noise since significant impacts would occur in these areas. The scenic values of cultural resources are incorporated in the cultural resources subsection in the Final Statement.

(39) Comment: (p. II-303) What is "visual vulnerability?"

Response: Visual vulnerability is defined in Chapter III Recreation Resources of the DES and FES.

(40) Comment: (p.II-313) Where in the text is a definition for "scenic quality," and what is the criteria for determining if it is high, medium, or low?

Response: Scenic quality is defined in Chapter III, Recreation Resources. The criteria for determining high, medium or low is contained in BLM Manual 6310, Illustration 1. The key factors include land form, color, water, vegetation, uniqueness and intrusions.

(41) Comment: (p. II-370) Reference is made throughout the EIS to the steady population decline in Page, Arizona and the likelihood of continuing that trend "...until something like the Kaiparowits project causes an influx." However, the new town will be on Highway 89 near Page...the influx will be at Glen Canyon City, not Page.

Response: Refer to the socioeconomic section, Kaiparowits Plateau area of the DES and FES for discussion on predicted population increases.

(42) Comment: (p. II-416) The EIS claims that "Even without the project, increasing demand for water in the Southwest and Southern California suggest the following trends:

- Use of groundwater in excess of recharge rate, especially in agricultural areas, will result in further subsidence of productive land;
- As groundwater supplies dwindle, perennial streams will have to handle water needs. In some cases, this will require importation of water using artificial channels."

If the Kaiparowits project proceeds as designed, this will only serve to worsen the water situation. In any case, there are ample groundwater reserves in the Southern California Basin, yet only the Metropolitan Water District is tapping them. These two points certainly do no justice to any merits of the project.

Response: The quote taken from the DES describes a future condition. Only enough water to control dust during construction will be used for the transmission system in California. This data was cited in Chapter III of the Draft EIS.

(43) Comment: (p. II-418) The EIS claims that "...the best scenic areas will probably be protected as much as possible, with or without the project." We

all hope so, but this is impossible to predict, especially in light of the impending decision on a Master Land Use Plan for the Glen Canyon National Recreation Area.

Response: The best scenic areas have been set aside as national parks, national monuments, recreation areas, etc., and are carefully protected against scenic intrusions. Intensive management of these high scenic value areas will continue indefinitely.

(44) Comment: (p. III-1) Under the summary of impacts on climate, the EIS claims that "No significant impacts on climate have been predicted to result from the project." The shroud of particulates to be released over the Southwest with Kaiparowits, Navajo, Four Corners and the others may in fact have the effect of reducing the frost-free season and consequently the growing season by reducing the incoming solar radiation.

Response: The current literature indicates mixed opinion regarding the potential for solar energy resource degradation and climatic change associated with coal-fired power plants. BLM is not aware of substantial evidence of significant regional changes resulting from a project of the scale proposed. As indicated in the impact statement, it appears that at present Four Corners and other power plants have not had a measurable influence on the Kaiparowits area. The Navajo power plant has a limited potential for interacting with the proposed power plant under certain meteorological conditions. The effect is not expected to significantly influence incoming radiation for periods long enough to influence the growing season.

(45) Comment: (p. III-3) Again, it is impossible to critique the EIS by simply reading the summaries as so many will do. The EIS states that particulates would have "...an impact on visibility." How big is the impact; one must read further. Such statements by themselves are of no value to the reader.

Response: The summary has been expanded, but the critical reader is encouraged to read the full text.

(46) Comment: (p. III-11) With regard to the all-revealing public opinion surveys conducted by the participants, no less, the EIS reports that "A small coalition of resident and non-resident conservationists would be disappointed if the project were approved." If everyone were conservation-minded, a separate designation wouldn't be necessary. Nevertheless, how did the EIS arrive at a relative number for the group by calling them small. We shall see how the protest letters run. Finally, disappointed is hardly the word to describe the response to regional impacts created by the Kaiparowits Project. It will affect recreational use and other personal aspects of the lifestyle generated by environmentally-concerned citizens, as well as thwarting the continued effort for a conservation effort.

Response: The Socioeconomic section and the Socioeconomic summary of the Final EIS have been revised with reference to the above comments.

(47) Comment: (p. III-12) The final statement in the summary of impacts states that "The increasing concern over air pollution, open space preservation, and mass transit may mitigate the expected degradation to some extent." How does "concern" mitigate expected degradation?

Response: Concur. The text has been revised.

(48) Comment: (p. III-18) The allowable increases in particulates and SO₂ are presented in the figure in ug/m³ but there is no way to compare these numbers with expected stack concentrations as they are listed on page III-16 in tons/hour emission. Only later, on page III-28 are values given; class I standards will be exceeded...a fact which is not given emphasis in the EIS considering that it is a major concern to the public.

Response: The data presented on page III-16 are emission data, related to the Federal New Source Performance Standards while those presented on pages III-17 and III-18 are ambient air concentrations related to the Federal Ambient Air Quality Standards and the Prevention of Significant Deterioration Regulations. All three standards must be met although they are not necessarily related. Additional discussion has been included in the Final Statement to help clarify this point.

(49) Comment: (pp. III-41, III-43) The EIS claims that methane and carbon dioxide from the coal mine would be diluted outside to insignificant levels and a plume of condensed moisture vapor would not extend a significant distance or last for a great length of time. These relative descriptions have little meaning to someone who is trying to evaluate impacts. Who determines what is significant, or great, or neither.

Response: In underground coal mines, effective ventilation systems are used to remove coal dust and dilute and remove mine gases (including methane) which could be harmful to mine personnel. These gases are expelled to the atmosphere at the mine surface. Although no measurements have been made, it is our opinion that these emissions are not expected to be a significant air pollution problem and would be of small magnitude compared to other pollution sources of the project.

(50) Comment: (p. III-47) The EIS admits (barely) that the "...most restrictive ambient air quality standards will be met or surpassed under 'worst case' dispersal conditions." By how much?

Response: This statement was in the summary paragraph which followed the body of the air quality text, this statement has been enlarged and moved to the Summary section. The body of the text discusses the predicted ground-level ambient air concentrations and the relationship to applicable standards.

(51) Comment: (p. III-49) The EIS admits that "Ground fogging and icing will occur at times during the winter." When will "at times" be... under what meteorological conditions? Later in the same paragraph, is the sentence, "Salt-drift deposition is predicted to have some influence on vegetation growth." "Some" is hardly the word to be used here, for in later pages the EIS states that this is the greatest impact on the ecological interrelationships. At a depositional rate of 165 pounds per acre per year, one can only conclude that this is in fact a major impact.

Response: This statement was in a summary paragraph which followed the body of the air quality text. It has been enlarged and moved to the Summary section. The body of the text discusses the conditions under which fogging and icing will occur and the soils section discusses the influence of salt drift on soils and vegetation.

(52) Comment: (p. III-59) In Illustration 1, the EIS claims that leaving pillars in place under major drainages and light cover areas will prevent /emphasis added/ subsidence. This an all-out fallacy. Mining 12 million tons of coal per year underground will create a void that will cause considerable subsidence...this cannot be prevented anywhere near 100%.

Response: The discussion on subsidence in Chapter III has been expanded in the Final EIS.

(53) Comment: (p. III-60) A verticle scale would have helped on Illustration 2, with the result of giving needed emphasis to the depth of mining...100 feet from canyon floors and 300-700 feet from the remaining Plateau surface. This is very close to the ground surface considering the volume of coal to be removed...subsidence under such a plan will be widespread. In the discussion of subsidence in the EIS, no mention is made of the impact created through the release of fumes through the fractured subsidence pits. Furthermore, the

subsidence pits can be created at various time intervals, even after mining is completed. Why is there no discussion of these factors.

Response: Refer to Chapter I, Coal Mine proposal. See Chapters II and III regarding coal subsidence pits. Due to the very minimal anticipated effect caused by fumes from subsidence pits (in relation to the other potential major sources of air pollution) we have not discussed this in the statement. Expected slow subsidence would create a slow rate of fume release.

(54) Comment: (p. III-66) One paragraph of impacts on geology and topography for the Limestone quarry does not suffice. What are the other minerals which will be lost? Will some drainage divides be altered?

Response: No other minerals are involved nor will any drainages be divided.

(55) Comment: (p. III-71) The EIS states: "The impacts would probably not be significant in the Warm Creek Drainage as it amounts to less than one-half of one percent." This sentence is incoherent as one can only infer that the impacts are one-half of one percent.

Response: The present annual runoff and sediment into Warm Creek is 1,000 acre-feet and 120 acre-feet, respectively. The estimated runoff and sediment into Warm Creek if the project is completed would be 1,006 and 119 acre-feet, respectively. The sentence in question has been rewritten in the Final Statement to read: The change in runoff and sediment deposition in the Warm Creek Drainage is considered to be insignificant as it amounts to less than a 1 percent change from present estimates.

(56) Comment: (p. III-79) Figure 19 would be enhanced if a column was included describing Federal standards or toxic levels. Otherwise, the numbers

are meaningless as one cannot guess what levels constitute hazardous concentrations.

Response: At the present time there are no federal standards or toxic levels developed for soils.

(57) Comment: (p. III-81) The EIS states: "The aggregate pit would be confined to the creek bed and would not present a runoff and erosion problem." How can this be when the excavation will release an enormous amount of sediment for transport during flash floods? Moreover, when the pit fills in with sediment from storm flow, it will contain sediment of sizes which are more easily entrained and will contribute to future sediment loads.

Response: The aggregate pit would be dug in the center of the creek bed without any contact with the creek banks. This pit would act as a sediment trap and settling basin during periods of infrequent flows as the velocity of water decreased due to filling the pit.

(58) Comment: (p. III-97) The EIS mentions possible effects on phytoplankton and phytoplankton plus spawning fish with a change in sediment yield to Lake Powell. The EIS claims the change will be for the decrease; however they have made the assumption that there would be no surface subsidence from mining. This is a serious mistake, as subsidence is more of a certainty than expressed in the EIS. In any case, it is more likely that Lake Powell will experience an increase in sediment yield because of the increased human activity. Because the methodology for determining sediment yields is not discussed, one can only guess that the reduction in exposed ground due to impervious project facilities is the reason for a reduction in acre-feet of erosion.

Response: Subsidence on John Henry Bench would decrease the runoff and sediment production. The top of the bench would become concave thus trapping runoff and sediment. Predicting sediment production due to human activity cannot be accomplished with any degree of accuracy due to the unpredictable and whimsical nature of man.

The methodology for determining sediment yield is discussed in Appendix III-9 in the reference material binding.

(59) Comment: (p. III-137) The EIS states: "Although concentrations of sulphur compounds would not be expected to harm vegetation of the Kaiparowits region, very little is known about cumulative long-term effect of these compounds." This has to be challenged on the basis of a 1973 EPA study titled "Effects of Sulphur Oxides in the Atmosphere on Vegetation." These effects can be summarized as follows. 1) High, short-term SO₂ concentrations cause a collapse of cells with subsequent development of necrotic patterns; 2) chronic injury ensues under long-term exposures to SO₂ causing cell disruption or destruction; 3) SO₂ interferes with photosynthesis, stomatal behavior, chemical composition, plus a reduction in growth and yield; 3) physiological changes including plant processes, enzyme systems, and chemical composition, plus reduction in growth and yield not visibly evident. More is known about SO₂ damage to plants than the EIS is willing to admit and describe to the public. Later on the same page, the EIS proports that the movement of mercury within Lake Powell's biological system is not well known but is presently being investigated. This is a further missing link to the EIS, particularly blaring because of its potential impact to the entire fishery of the lake.

Response: The statement in the Draft Statement referred to cumulative, long-term effects of sulfur compounds and was not intended to imply that little was known of acute, chronic, or subtle effects of SO₂ on vegetation as defined

and discussed in the referenced document. Based on sulfur dioxide emissions allowable under presently applicable regulations, the ambient air concentrations are not expected to be sufficiently high to cause vegetation injury.

Long-term ambient air concentrations are not expected to cause significant chronic or subtle vegetation injury. However, vegetation has been identified as a collector sink for sulfur dioxide. This effect, as well as long-term accumulations of other sulfur compounds such as sulfates, could conceivably be a beneficial impact in areas where sulfur or nitrogen shortage is a limiting factor to plant growth.

The discussion of mercury in the Lake Powell biological system has been expanded in the Final Statement. See response to Crall's comment No. 1, hearings section.

(60) Comment: (p. III-156) The EIS states: "In the arid Kaiparowits Basin acid rain would be expected only under a rare combination of conditions." The report fails to discuss ANY effects of acid rain on the Plateau vegetation.

Response: Discussion on potential impacts of acid rain was expanded in the Final EIS. See response to Spence's comment No. 2, hearings section.

(61) Comment: (p. III-185) The EIS states: "No data exists on the scientific importance of the paleontological values in the areas of the proposed townsite and highway system." Why haven't these studies been conducted? Another missing link...

Response: Paleontological studies which have been compiled for areas of the proposed action noted no unique values. Studies for the proposed townsite and highway would be conducted prior to any disturbance.

(62) Comment: (pp. III-299 through III-334) This entire section, "Impacts in the Market Area" is not entirely accurate now that the Salt River Project has withdrawn from the Kaiparowits Project. Where will the unallocated 18% (!) of electricity go? What will be the subsequent changes in population and energy consumption patterns?

Response: The text of the Final EIS has been revised accordingly now that the Salt River Project has withdrawn as a participant. See the statements contained in the Market Area sections of Chapters III and V. At the present time (January 1976), the remaining 18% of Kaiparowits electrical energy is unallocated.

(63) Comment: (p. IV-5) The chapter on mitigating measures is divided into sections depending on who promoted the mitigating ideas. The EIS states: "The assumption in this chapter is that participants would act in good faith by implementing the measures they /the participants/ have proposed and in complying with applicable statutes and regulations." By the use of some careful wording, the authors of the EIS have avoided saying anywhere whether the participants will abide by the mitigating measures proposed by Federal, State, and Local entities.

Response: The assumption that the participants would act in good faith was made for analytic purposes, and it is noted immediately following the quotation that failure of the measures or lack of implementation would result in impacts discussed in Chapters III and V. As stated in the Final Statement, Chapter IV, most of the participants' proposals for mitigation of impacts are in compliance with laws and regulations. As noted, stipulations, bonding, and other means are utilized by administrators to ensure consideration of environmental and other values. Chapter IV now describes those measures the applicant will be required to take vs. those that are nonenforceable and based on good faith.

(64) Comment: (p. IV-12) The EIS states: "However, there are no detailed, formal proposals for monitoring programs at this time." This missing link makes it awfully hard to critically analyze the participants' intentions.

Response: The next paragraph on page IV-12 states that the participants are negotiating with federal agencies to develop suitable air and water monitoring programs. These negotiations are still underway; therefore, the same paragraphs appear in the Final EIS.

(65) Comment: (p. IV-16) The EIS mentions that a monitoring program would include use of observation wells to detect changes in temperature and conductance of water near ponds. The EIS does not say what mitigating measures will be implemented if serious changes are noted.

Response: Observation wells would be one of three possible means of monitoring, as indicated on page IV-16 of the Draft Statement. It was stated on page-101 of the Draft EIS that the participants proposed to repair any detected leaks in the evaporation ponds. This has been added to Chapter IV of the Final EIS.

(66) Comment: (p. V-1) The EIS states: "Small amounts of trace elements,... would be released and accumulated over the life of the plant and these have potential for adverse impacts." This statement, by use of the word "small," implies small impacts which is incorrect, particularly with releases of mercury with subsequent biomagnification.

Response: The sentence has been revised in the Final EIS.

(67) Comment: (p. V-2) The EIS suggests a surface subsidence of 15 to 18 feet, the first appearance of any numerical value of the potential impact. How was this number derived? For such a large volume of coal to be removed, experience would indicate a potential for subsidence approaching 100-200 feet!

Response: Figures and values were initially discussed in Chapter III. See expanded text on subsidence in Chapters I and III of the Final EIS.

(68) Comment: (p. V-7) Under the heading of "Recreational resources," only one sentence is devoted to the most objectionable impact of the entire project: "Haze and sky discoloration from plant emissions would adversely affect the scenic resources of south-central Utah and north-central Arizona."

Response: The discussion of haze and sky discoloration is expanded in the Final Statement and is more descriptive in terms of the impacts. For a more detailed description of the impacts of haze and sky discoloration, see the Air Quality sections in Chapters III and V and the Recreation (aesthetics) section, Chapter III.

(69) Comment: (p. V-14) The EIS states: "Studies by Bechtel Power Corporation (1974) have indicated the brown discoloration would usually not be noticeable unless the observer was looking along the plume axis. However, the plume at Navajo is quite noticeable from any angle." The second sentence, confirmed by actual direct observation, conflicts with Bechtel's "study." In this case, we should believe our eyes instead of the self-fulfilling studies of Bechtel, a firm hired by the participants.

Response: The Bechtel study predictions were based on certain assumptions of meteorological conditions, nitric oxide emissions, conversion of colorless nitric oxide to nitrogen dioxide, plume dispersion, meteorological conditions, and wind speed, as related to the Kaiparowits proposal which may or may not be the condition at Navajo. It is true that yellow discoloration is frequently associated with the Navajo plume. It is discussed in the impact statement. Additional information has been added to the Final Statement concerning the brown discoloration observed at Navajo. As the statement indicates, the frequency of

occurrence, meteorological condition under which it appears, and extent of distribution and influence on visibility have not been adequately documented.

(70) Comment: (p. V-29) The drift loss from cooling towers would add ten tons (!) per year into Warm and Wahweap Creeks, but the EIS claims the effect on aquatic life in Lake Powell would be too small to evaluate. Fish tend to spawn on lake margins, especially at tributary outlets which deposit the majority of nutrients. This is where the large loads of salt will be delivered, yet the EIS claims the effects are negligible!

Response: The salt load contributed by present normal runoff in Warm and Wahweap Creek drainages is estimated at about 1,000 tons annually. An increment of 10 tons annually would have minimal added effect.

(71) Comment: (p. V-60) Limestone would be hauled THROUGH Bryce Canyon National Park at 30 round trips per day, six days per week, for 35 years. As mentioned in the EIS, this would result in a degradation of park values. Is this allowable?

Response: Yes, this would be allowable because this is a State Highway.

(72) Comment: (p. VI-4) The EIS claims that there would be no interaction of emissions among the Kaiparowits, Navajo, San Juan, Four Corners, Huntington, and Mohave plants. The EIS then goes on to say that this hypothesis is largely untested. While it is fortunate that the EIS qualified their opinion, it should be pointed out that the emissions don't have to interact to have a cumulative effect. That is, emissions by all plants will act together to degrade regional air quality of the Southwest. An adequate regional impact statement would point this out.

Response: See responses to Rudolph's Comment No. 7 and Janke's Comment No. 2 presented in the Hearings comment section.

(73) Comment: (pp. VIII-229 to VIII-282) Why is so much attention given to the alternative power plant site at Nipple Bench WHEN THIS SITE WAS ALREADY REJECTED by the Department of Interior for reasons stated in the report. Thus, one infers that the only alternative to the project is no project at all since the Nipple Bench site would never be accepted.

Response: Seven proposed sites in the vicinity of the Kaiparowits Plateau were examined. Of the seven, the Nipple Bench alternative was the best alternative to the Fourmile Bench location; therefore, additional information was presented relating to the Nipple Bench site in order to assist the decision maker.

7. U.S. Dept. of Transportation, Federal Highway Administration

No response required.

8. Southeastern Colorado Wilderness Coalition

No response required.

9. Sierra Club, North Dakota Group

No response required.

10. New Mexico Wilderness Study Committee

No response required.

11. Advisory Council on Historic Preservation

(1) Comment: Pursuant to its responsibilities under Section 102 (2) (C) of the National Environmental Policy Act of 1969, the Advisory Council on Historic Preservation has determined that your DES is inadequate regarding our area of expertise as it does not demonstrate compliance with Section 106 of the National

Historic Preservation Act of 1966 or Sections 1(3) and 2 (b) of Executive Order 11593, "Protection and Enhancement of the Cultural Environment" of May 13, 1971, as implemented through the Advisory Council's "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800).

However, we note on Page III-199 of the DES that Bureau of Land Management (BLM) has determined that the proposal will adversely affect cultural resources and that BLM proposes to enter into a Memorandum of Agreement with the Advisory Council "as required by 36 C.F.R. Part 800." Therefore it appears that BLM proposes to obtain the comments of the Council pursuant to Section 106 and the Executive Order.

Response: The Bureau has completed the necessary Section 106 data and have entered into a "memorandum of agreement" with the Advisory Council. See Chapter IX of the FES.

12. Wyoming-Utah-Nevada Chapter Outdoors Unlimited

(1) Comment: Since Arizona and California are to be the principal beneficiaries of the electric power, why should not the water consumed in the actual power production be drawn from those state's allocations rather than Utah's?

Response: This is a decision of the State of Utah, and presumably is considered by the State to be an equitable trade-off for the economic gains the proposed project could bring.

13. Utah Manufacturers Association

No response required.

14. Operating Engineers Local Union No. 3 of the International Union of Operating Engineers

No response required.

15. Scott Bailey

(1) Comment: The EIS clearly states the impact volumes (daily): 12.2 tons fly ash, SO₂ 34.3 tons and 120 tons NO₂ (under ideal conditions-no equipment failures) but the impact on health of down-wind resident is ignored. The haze effect, wildlife and plant diminution, et... cannot be overlooked either.

Response: Refer to response to Phillips' Comment No. 2, Hearing section.

(2) Comment: As a chemical engineer by training (registered in Michigan) the reliability of pollution control equipment will not permit operations at the ideal 99.5% levels. Thus, the actual pollution will be greater than that mentioned in paragraph one. Up to 112 tons/hr. fly ash and 22 tons/hr. SO₂ may be emitted in the event of scrubber malfunction.

Response: With regard to health effects, see response to Mr. Phillips' Comment No. 2 in the Hearing section.

With regard to the efficiency of the pollution control equipment, see response to Spence's Comment No. 1, Hearings section.

16. City of Banning, City Manager

No response required.

17. Utah Mining Association

No response required.

18. State of Arizona Oil and Gas Conservation Commission

No response required.

19. Environmental Task Force

No response required.

20. Mildred and Carl Ehrman

(1) Comment: The "social fabric" of southern Utah's people will be heavily "disturbed" if not destroyed. It will be extremely difficult for the 2700 people of Kane County to deal with the 450% population increase within the predicted ten years. The proposed special new town for these new people is as yet unfunded and no finances are seen as forthcoming at this time. The bill passed by the Utah State Legislature allowing bonding for the town is well intentioned but ineffective as far as supplying market for those bonds. The physical problems of the town are not faced. Where will the water come from? What will be the effect on the local water table if this water supply is drawn from underground? Who will provide fire and police protection? Where will medical care come from? Who will pay for all these basics? How much will the taxes increase for the residents of the county since financing for the proposed new town is an idea rather than a reality?

Response: Water for the new town would come from wells and/or an additional 10,000 acre feet would be available from the plant and mine allocation if necessary. Refer to the Contingency Plan found in Chapter I. The local water table would tend to lower somewhat and then stabilize. The ground water would come from the Navaho sandstone formation which contains a large aquifer. Kane County would supply needed police and fire protection services until the new town is built, after which the new town would become self sufficient. Similarly, medical services are presently adequate and a contingency health plan has been developed. Taxes would ultimately subsidize the new town along with the bills you referred to, but exact tax amounts per person cannot be determined at this time.

(2) Comment: The impact of the physical environment would be so great and so irreversible that it is difficult, if not impossible to understand why this

project was planned to be placed within the 200 mile circle which contains 20% of the National Park lands of the United States. Why was a real alternative not considered? Two sites in the same neighborhood is no "alternative". Why the fragile desert where the scars will never heal?

Response: See response to McComb's Comment No. 2, Salt Lake Hearings Section.

(3) Comment: After the 35 years or so of the operation of the plant it will be abandoned and its solid waste dump buried under a scant 12 inches of soil which will be seeded and left. Who will tend this huge pile of poisonous waste? Who will see that sod develops? How will it be assured that the grass will not die, leaving the soil to be eroded away and the mass to be blown, washed and leached into the ecosystem of the entire area? Who will pay for the perpetual care until the sod is firm and solid enough to prevent the waste from wandering?

Response: Once the title of the land has passed from federal to state to private ownership then the solid waste dump and rehabilitation of the site after abandonment would come under the jurisdiction of the State of Utah and Kane County government. Currently there are no known state and county laws and regulations that would require rehabilitation after abandonment or ensure other successful rehabilitation measures. If the abandoned site became a pollution problem, then state and/or county tax monies would be used to pay for the care of the site.

Federal regulations would only apply if the power plant was constructed under a federal right-of-way grant and the land remained in federal ownership. If this were the case, the utility companies would pay for the care of the site after abandonment.

21. U.S. Dept. of Transportation, Federal Aviation Administration

No response required.

22. City of Banning, Chief Building Inspector

(1) Comment: The proposed transmission system would cross over and be visible from State Highway 243. The State of California has declared Route 243 as a Scenic Highway and specific environmental review indicating total visual impact to this area should be prepared.

Response: This concern was discussed in the Recreational Resource sections in Chapters II, III, and V.

(2) Comment: The Kaiparowits transmission system "if" installed in the corridor at the base of the San Jacinto Mountain will cause irreversible adverse effects to the visual quality of the Pass environment. As the City of Banning already has many utility corridors passing through the community, the cumulative effect of additional transmission lines on our environment must be considered.

Response: The effects of the transmission line through the pass has been considered in preparation of the EIS. We are not aware of any study that analyzes the cumulative effect of additional lines in this area. The cumulative effect of additional lines was not included in this statement. This matter was considered but it was not included due to the lack of information.

(3) Comment: The draft environmental review cannot be considered as complete or accurate and should not be accepted until a Master Plan for all utility corridors, existing and future, has been prepared and evaluated for possible visual effects to the environment.

Response: Under NEPA requirements, an environmental impact statement can be considered complete and legally adequate without such a plan.

23. Rocky Mountain Federation of Mineralogical Societies

(1) Comment: Summary: Point 3; 8th line in 3rd paragraph. "The indirect effect impact of increased population would cause environmental effect on other

resource values e.g. increased recreational use, which would cause soil erosion, destroy vegetation, disturb wild life, etc."____ We would prefer that the following words be added to that sentence or substituted for the present words - see underlines - change "would" to "might" add at end of sentence, "unless a set of regulations governing such use is drawn up and implemented."

Response: It is our judgement that the use of the word "would" is editorially and inferentially valid. From a sociological point of view, an increased population of the magnitude proposed in the impact area would result in increased recreational use, which would cause soil instability, destroy vegetation and disturb existing wildlife habitat. Therefore, a change in the text is not necessary.

(2) Comment: Page II-241 ff. Paleontological, archeological, and historical. In order to preserve, classify and when necessary protect such areas - all would suggest getting help from organizations such as universities and governmental institutions to study and classify such areas and to give suggestions as the their preservation - specimens of paleontological and archeological materials and artifacts could be then given to museums where they would be preserved. One of the counties that might be interested is San Bernadino County, California. We would suggest that arrangements be made with interested universities which might give scholastic credits to students and instructors doing actual work in the field. The data you have set forth in this section would be a big help for such persons. Incidentally many of the areas involved above have been discovered by rock and mineral club members.

Response: Measures to preserve and protect sites within the secondary influence zone are being studied at the present time.

(3) Comment: Chapter V - Adverse effects Recreational Resources. Page V-7 - 2nd paragraph. Many tourists would enjoy seeing the facilities and would

feel that something was being done for people. 3rd paragraph. My studies have shown that we have a quite sufficient amount of "back-country" already set aside so what is lost here would hardly be missed.

Response: No doubt many people would find the power and coal mine facilities interesting. Nevertheless, the structures associated with these facilities would not be harmonious with the natural environment. We concur that the loss of backcountry would not be great. In Chapter III, it was estimated that less than 1 percent of the "back country" type area within a 100 mile radius would be lost. However, it would be an unavoidable impact.

(4) Comment: V-49 - Paleontological, archeological and historical destruction or disturbance - See comment re. Corps of Engineers ante. V-52 - 3rd Paragraph - Perhaps the new town could be planned and laid out so as to preserve such scenic sites or a view point established. V-53 - We object to the statement set forth in (1) thru (7) - We do not commit any of the offenses mentioned and are well-aware of the Antiquities Act (6) Perhaps this refers to residents of the new town - if so I believe close attention should be given to the types of persons employed. We noted that in the Rainbow Basin near Barstow, California, no guards are present yet the persons touring that basin comply with the regulations. The same is true of the Mesa Verde etc. historical sites and in Platt National Park in Oklahoma.

Response: The above referenced items are discussed to reflect the impacts which could be caused by persons either insensitive toward our cultural resources or unaware of the laws regarding our "antiquities". It was not meant to reflect upon members of the mineralogical societies.

24. Robert G. Bear

(1) Comment: The bald excuse of "reduced reliability" does not justify rejecting the proposal to eliminate 2,000 foot spacing between the preferred 2

parallel 500 kV lines and instead to use rights-of-way adjoining and paralleling existing lines along the proposed transmission route.

Response: The 2,000 foot separation is not rejected in the EIS. In the analysis of line spacing alternative (Chapter VIII), the possibility of not allowing a 2,000-foot separation is discussed. In addition, the possibility of reduced reliability of the system deserves mention; it is not presented as justification for rejecting this particular alternate.

(2) Comment: No substantial reasons were given for preferring a transmission system involving 2 parallel 500 kV lines instead of a single 600 kV DC line. A single line system obviously would have far less visual impact than a double line system. There is an important additional advantage to DC lines: The draft EIS says the DC Lines can be placed underground without any great problems for distances up to 40 miles, compared to 1/4 mile for AC lines. In places close to the Los Angeles metropolitan area like the San Gorgonio Pass area where I live it would be highly desirable to underground the line here and there to soften public resistance to the visual impact of even one more power line in areas already heavily impacted by utility lines.

Response: The first sentence of this comment used the word "preferred" in reference to the proposed transmission system. The EIS does not indicate a preference of two 500 kV ac lines over a single 600 kV dc line. The former is part of the participants' proposal; the latter is an alternative considered in Chapter VIII.

(3) Comment: I believe that there has been inadequate study and justification for rejecting the alternative proposal of dry cooling towers at the power plant site. The excuse stated is not enough experience and unknown weather effect of releasing heated air. Considering the growing water shortage in the Southwest, the over-allocation of Colorado River water and the excess salinity in

the same River, it seems to me that dry cooling should receive far more serious consideration than the EIS indicated.

Response: See Chapter VIII of the Final Environmental Impact Statement for a discussion of the feasibility of dry cooling towers.

(4) Comment: Lastly, it seems to me that the EIS exaggerates the urgency for increasing power availability in the Southwest. If the past half-hearted conservation campaigns could secure the cutbacks in power consumption already obtained, serious future campaigns combined with higher power costs should be able to attain much greater cutbacks.

Response: The need for more power in southern California has been predicted by the participants, by the State of California Study, (Energy Dilemma, California's 20-year Power Plant Siting Plan, The Resources Agency, Sacramento, CA, June 1973), and by the Rand Study, (California's Electricity Quandry: I. Estimating Future Demand, Mooz, et.al., Rand Corporation, Santa Monica, CA, Sept. 1972). The Ford Foundation study, (A Time to Choose, 1974), points out the need for additional electrical energy nationwide over the near term. Energy conservation must be planned on the national, state, local, and individual level. Additional electricity will be needed before energy conservation measures become effective.

25. State of Utah, Dept. of Development Services, Division of State History

(1) Comment: On the whole the treatment of historical and archaeological resources lacks thoroughness, which would appear to be the result of limited survey work and the absence of high-level professional guidance.

Response: Several well-qualified, professional archaeologists have been involved in the preparation of the EIS. Due to lack of data and intensive inventory studies, therefore, the historical and archaeological resources discussions are not complete.

(2) Comment: In the absence of survey and research work on the portions of federal land to be turned over to private interests, it is possible that this transfer of property would not satisfy the requirements of Section 106 of the National Historic Preservation Act of 1966, and further, that under sections 1(3) and 2(b) of Executive Order 11593 and the "Procedures for the Protection of Historic and Cultural Property (36 CFR Part 800)" would be unlikely to pass review by the President's Advisory Council on Historic Preservation.

Response: The Draft Statement has been thoroughly reviewed by the President's Advisory Council on Historic Preservation. This is in accordance with Section 106 of the Historic Preservation Act of 1966 and Section 2/b of Executive Order 11593 of 1971. As a result of this review the Bureau of Land Management as the principal federal agency involved is entering into a memorandum of agreement with the Advisory Council. See copy of agreement in Chapter IX, Consultation and Coordination.

26. U.S. Dept. of Housing and Urban Development

(1) Comment: Since HUD's areas of jurisdiction for comment as established by the Council of Environmental Quality all apply to urban areas, the balance of our review was limited. We offer, however, that when planning new roads and railroad trackage, that they be far enough from areas set aside for residential use so as to avoid noise problems. HUD has definitive guidelines on noise levels and if we can assist you later with this concern, please feel free to contact us.

Response: Noise problems and other potential impacts that could result from new town-highway locations are identified in Chapter VIII.

27. Lake Powell Research Project

(1) Comment: In Chapter III, page 5, under the heading, "Water Resources," the statement is made in the second sentence that withdrawal of the 50,000 acres

feet for Kaiparowits "would reduce Utah's remaining allocation of Colorado River by about 3.8%." This statement can only be termed extremely misleading. The earlier portions of the report state that the figures are based on the Department of Interior estimate of 5.8 million acre-feet being available for Upper Basin consumptive use. After one deducts the 50,000 acre-feet for Arizona, and allots 23% of the remaining to Utah, this gives the figure of 1,322,000 acre-feet remaining for the State of Utah. This is the figure used in the EIS. The 1974 figure for consumptive use in the state of Utah is 825,000 acre-feet per year. Simple subtraction gives the state of Utah a remaining amount of 497,000 acre-feet per year of consumptive use to allocate for new users. These figures are reviewed in Chapter I, page 354. If 50,000 acre-feet per year are used for the Kaiparowits plant, this would amount to 10% of Utah's remaining allocation of Colorado River water. If the Kaiparowits plant uses the full 102,000 acre-feet that they have contracted for, then this facility would be using over 20% of Utah's remaining allocation of Colorado River water. The 50,000 acre-feet per year figure is actually 3.8% of the entire amount of Colorado River water available for use in the State of Utah. The 102,000 acre-feet contracted for, amounts to approximately 7.7% of the entire amount of surface water available from the Colorado River system for the State of Utah. These points should be made clear. There should be no possibility for misunderstanding the size of the percentage of Utah's share of the Colorado River water that will be, and could be used by the Kaiparowits Power Plant.

Again, in Chapter III, page 120, it is restated that, "withdrawal and depletion of 50,000 acre-feet per year for the proposed project would decrease Utah's remaining share of Colorado River water (1,322,000 acre-feet per year) by about 3.8%." This statement also must be corrected to state that it is 3.8% of the entire allotment for the State of Utah and that it is over 10% of the remaining share of Colorado River water for the State of Utah.

Response: Concur. Text has been revised.

(2) Comment: In Chapter I, on page 358, there is a statement indicating 1,368,500 acre-feet of water has been filed for in the State of Utah in relation to possible energy developments. The EIS should differentiate between how much of this water is surface water and how much of it is ground water. It is unclear whether this is all in the Colorado River Basin or not. This should be clarified. The point should be made in the EIS that as a result of these filings, there is probably not enough water for all energy uses, let alone all other uses. Some applications cannot be approved because physically there is not enough water for all. It is stated that the state engineer has not moved on some applications for several years. This perhaps is one reason for the caution in approving new applications because it is realized that there will have to be denials, and the need for careful analysis of each application is in order.

Response: Very little of the 1,368,500 acre-feet under application is from ground water sources. The amount is estimated to be about 50,000-75,000 acre-feet per year.

With regard to the second part of the above comment, it is not within the scope of the EIS to address availability of Colorado River for all other uses. It is our purpose to address the impact of withdrawing 50,000 acre feet per year, for the proposed project, on availability of water for all uses. This is done in Chapters III and by stating that Utah's remaining share of Colorado River water would be reduced by 10 percent.

(3) Comment: Another topic that should be cause for considerable concern is the description of the ultimate fate of the evaporating ponds and the sludge material from the power plant. It seems to be more or less stated that after the lifetime of the plant the containment of the remaining salts in the evaporation pans and the sludge, with its toxic trace elements, will most likely wind up in

Lake Powell, as the dams and barriers are no longer maintained, eroded away, and the material washed down into the lake. It would be hoped that there is some alternative rather than just stating that this is an inevitable consequence. The entrance of these materials, some of them toxic, into Lake Powell after the 35 year life-time of the plant, would have a serious negative effect on the water quality of the reservoir.

Response: Concur. The text has been revised. It is possible that retaining structures and other mitigating measures would prevent contaminants in these areas from reaching Lake Powell in toxic concentrations. However, the potential exists for possible contamination of the lake, especially if retaining structures are not maintained indefinitely.

(4) Comment: As a minor editorial comment, in Chapter II, on pages 290-291, the captions for the illustrations are reversed. The Cockscomb is shown on page 290 and the sandstone formations in the Escalante area are shown on page 291, the opposite of what the two captions state.

Response: Concur. Captions have been corrected.

(5) Comment: Our conclusion on the debit side is that the EIS fails to indicate the potential cumulative impacts for other proposed projects in the region in addition to the Kaiparowits Project. We would like to see an EIS for the Kaiparowits region, not just the Kaiparowits Project, which is only the first of several proposed coal developments in the region. Most of the comments which follow can be grouped under this general criticism.

Response: See responses to Rudolph's Comment No. 7 and Janke's Comment No. 2 presented to the Hearing comments section. For air quality, refer to Interrelationship section of Chapter I and Air Quality section of Chapter VI.

(6) Comment: On page II-79 of the EIS it is stated that "During the mid-1960s the U.S. Geological Survey (USGS) estimated Kaiparowits Plateau coal

resources at 40 billion short tons (2,000 lbs), including major deposits in the Straight Cliffs Formation as well as those of less importance in the Dakota and Tropic Shale Formations."

This statement is not referenced to a particular source in the literature of the USGS, and we feel it should be in view of the magnitude of this large resource,* and the fact that it is one order-of-magnitude larger than the official estimate given by the U.S. Bureau of Mines (1974, Bureau of Mines Circular 8647, Fuel and Energy Data 1972, by Crump and Readling, page 58. On this page, 4.025 billion tons of coal are reported for Utah).

The LPRP has compiled the earlier estimates of Kaiparowits coal resources which have appeared in the literature. According to our findings, the official estimate of the USGS in the mid-1960s for coal in the Kaiparowits Plateau was 7.3 billion tons. We believe that it was not until 1974 that the USGS estimate was raised to 40 billion tons. The actual references to various previous estimates are given in Table 1. We believe that the significant feature of these estimates is their rapid increase with time. There is reason to believe that the estimates will INCREASE as further geological exploration is funded and completed. The coal reserves of the Kaiparowits are vast, and the estimate of their magnitude has been rapidly increasing with time. See Table 1 on the following pages.

Response: Text has been revised as appropriate. The data was referenced; however, the 40 billion ton figure was deleted since it was not consistent with other data. USGS is still evaluating the resource based on an extensive mapping program and additional drill hole data which is now becoming available.

*One billions tons of coal will produce an amount of electricity approximately equivalent to all the energy used in the United States during a period of 3 months. See page 5, Edward Teller, Energy: A Plan for Action, Commission on critical choices for American, 1975, 80 pages.

(7) Comment: The vastness of the coal reserves in the Kaiparowits Plateau and the present leasing of this immense resource indicate that more coal-fired powerplants on the Kaiparowits Plateau will be proposed in the near future. (Some indication of additional developments is given by Figure 70, I-346, which shows the location of the proposed Garfield Plant.) We believe that beyond indicating the total coal resources of Kaiparowits, it is equally important to show the leasehold and ownership status of all the Kaiparowits coal in order that judgments about potential future development and cumulative impacts can be made.

Response: The scope of the Kaiparowits EIS did not include the requirement to analyze the entire Kaiparowits Plateau coal field or the status of all coal lease holds on the plateau. Such analysis would require a new EIS.

(8) Comment: On page A-157 of the EIS is printed a map of leases in the area of the proposed development (which may be regarded as the first on the Plateau). Because of the extensive coal resources of the Kaiparowits area, there is actually a much larger contiguous area of leases than this map suggests. In the draft coal chapter of the Kaiparowits Data Book, first distributed in November 1974, a lease map is presented covering a much larger area. We feel that unless the public is given a chance to view the true extent of leasing in the Kaiparowits, it will be difficult to understand the possible cumulative effects of the construction of several mine and powerplant projects on the Plateau. For comparison we enclose here a copy of Figure 16, the lease map from the coal chapter, and the explanatory tables accompanying it. The area reported in the EIS is in heavy outline. It is important in the case of the Kaiparowits EIS to give the public some impression of the future of the whole area, which may include several stages of development because of the extensive coal leases. We feel our more comprehensive map and tables convey a sense of the possible cumulative impact. We feel that the brief statement (page I-116) that the Kaiparowits Project holdings

"equal 21 percent of the total" does not adequately present the picture of a large contiguous area of very numerous leases, nor a sense of the impending impact from additional projects.

Response: See our response to the previous comment.

(9) Comment: On page II-295, illustration 43, a map is presented showing the location of Grosvenor Arch, and on pages A-314 through A-317 of the Reference Volume are shown the proposed roads servicing the coal mine and powerplant area. The impact of the road on the Arch was not discussed beyond the assessment that there would be a view of the road from the Arch, and that the Arch is a high visual vulnerability area (II-303, illustration 48). The Arch and the road are not shown on the same maps, making it difficult to see their proximity; maps in two different volumes of the EIS must be viewed simultaneously and compared. We recommend that a map showing both the Arch and the road should be included.

Response: Concur. Text has been revised. Grosvenor Arch has been added to Illustration I-2 in Chapter 1. The map is referenced in the narrative where the impact is assessed.

28. National Parks and Conservation Association

(1) Comment: NPCA's primary comment on the DEIS, therefore, is that it fails to reveal realistically the deficient water resources on which the success or failure of the Project so critically hinges. Furthermore, by failing to indicate any alternate source of those resources, the DEIS implies that no alternative exists.

The oral testimony, in summary, predicted that the water requirements to be provided from Lake Powell would probably be unavailable after about the year 2005, at which time only 23 years of the planned 35-year payout period would have elapsed. The premises, calculations and data sources on which this conclusion is predicated will be fully detailed herein.

Response: Mr. Coshland of the NPCA has demonstrated that, if the Upper Basin use reaches 6.1 million acre-feet of consumptive use by the year 2000, the reservoirs of the Upper Colorado River System will be slowly dried up by the release of 8.25 million acre-feet to the lower basin. We agree that under those conditions this would likely happen.

It has been the Bureau of Reclamation's position in certifying available water to the water service contracts out of Navajo Reservoir that the limit of Upper Basin use would be about 5.8 million acre-feet during a period of runoff similar to that which occurred between 1906 and 1974. In order to avoid a critical compact interpretation, this limit of Upper Basin use has been based on the assumption that the Upper Basin would be obligated to deliver 75 million acre-feet of water every 10 years at Lee Ferry, plus 750,000 acre-feet annually toward the Mexican Treaty deliveries. In preparing this estimate of limit of use, the Bureau has recognized that in years or periods of years of low flow, the water physically available to be diverted for irrigation use is less than normal at the point of diversion. Therefore, for periods such as the 1931 to 1974 used by Mr. Coshland, the average use projected by the Bureau studies in the Upper Basin would be about 5.4 million acre-feet or about 93 percent of normal. Within this 5.4 million acre-feet, water would be available for the Kaiparowits Project. Water availability studies for the Upper Colorado River Basin, prepared by the Bureau, recognize depletions of 102,000 acre-feet by the Kaiparowits power plant in 1990 as provided for in the water service contract for the project. The Kaiparowits power plant water service contract also provides for a reduction in the quantity of water available for delivery to the power plant under certain conditions to 82,000 acre-feet in year 2011, 62,000 acre-feet in year 2021, and zero in year 2031.

(2) Comment: The Kaiparowits Project is planned to pay off over a 35-year period. NPCA's studies show that, barring major policy changes which will take a long time to effect, Lake Powell will probably fail to provide the required water beyond about 23 years.

Response: In summary, we believe that Mr. Coshland has arrived at an erroneous conclusion from his studies by not recognizing the 5.8 million acre-foot limit that is one of the basic premises of the Bureau of Reclamation water supply studies for the Upper Colorado River Basin. Any increase above this amount would result in an overdraft of storage and result in dry reservoirs as indicated by Mr. Coshland's study. In his analysis, Mr. Coshland has also apparently allocated some storage space in Lake Powell to flood control. Although there is no formal flood control plan for Lake Powell requiring that space be provided for this purpose, the interaction of the flood control operation for Lake Mead and the requirement of the Coordinated Long-Range Operating Criteria (that after certain conditions have been met the active storage in the two reservoirs is to be maintained equal) might conceivably result in some minor quantity of water being released in high runoff years when the reservoirs of the CRSP system are nearly full. This would be adverse to the interest of conserving water for consumptive use. The impact of this requirement on the 5.8 million acre-feet figure we have used to represent the limit of Upper Basin average annual consumptive use would be almost negligible when spread over the 34-year critical period (1931-1964). Also, our studies do not indicate that the part of the flood control space provided in Lake Powell as a result of splitting some of the Lake Mead requirement would likely be nearly as high as Mr. Coshland states. Mr. Coshland also may not be aware that irrigation projects can usually operate with short water supply during critical periods of runoff.

We recognize the value of estimates of long-term records of water supply such as those provided by tree ring analysis. We also must recognize

the fallibility of these data for precise determinations of water availability. The usable flow figures we have used are based on a long period of actual measured quantities and is recognized as a valid and defensible means of projecting future streamflow. The many records we have are usually of sufficient length as to minimize the probability of realizing future flows which are significantly different from those recorded. Furthermore, the record we have used is similar to the yield developed from tree ring analysis.

29. Richard L. Casperson

(1) Comment: The statement is deficient in addressing the long term, cumulative effects of increased air pollution on human health, the area ecology, and the general aesthetics of the region in its present state.

Response: See responses to Spence's Comment No. 1, William's Comments, Crall's Comment No. 1, and Phillips' Comment No. 2, in the Hearing section.

(2) Comment: The effects of the associated roads and power transmission lines are not quantified in the DEIS. An omission typical of a technology that historically has been oblivious to environmental concerns of all kinds.

Response: The effects of the associated roads and transmission lines were quantified in the DEIS. In Chapter I Figures 31, 32, 33, 34, 35, 36, 37 and 38 quantify locations and areas influenced by the proposed transmission lines. Also in Chapter I, Figures 39, 40, 40a, and 40b quantify areas of land occupied (temporary and permanent) by the proposed transmission system.

Chapter III quantified: (1) noise and air quality effects that were quantifiable. (2) Figures 12 and 13 quantified effects on topography. (3) Figures 29, 30, and 31 quantified effects on soils. (4) Water resources that would be used are quantified on pages III-130 and 131. (5) Acres of the various vegetative types disturbed were quantified in Figures 33, 33a, 33b, 34 34a, 34b

and 35 plus other data presented in the vegetation text. (6) Wildlife and wildlife habitat affected are described on pages III-162 to 175 in addition to Figures 37, 38, and 39. (7) Archaeological effects are quantified in Figures 41, 42, and 43. Exact locations are not identified to prevent plundering of sites or areas. (8) Effects on recreational resources are quantified on Figures 46, 47, 48 and 49. Other effects are identified in the narrative. (9) Effects on land use are described on pages III-243 through 249. (10) Social and economic effects, where quantifiable, were shown on pages III-289 to 298.

(3) Comment: Why did the DEIS not concern itself with alternative uses for the Colorado River system water committed to the power plant proposal? Again, an example of too narrow a vision.

Response: See response to Rudolph's Comment No. 2, Hearing section.

(4) Comment: Since I travel through Rock Springs, Wyoming on occasions and have witnessed the "transfiguration" of that area over a long period of time, how do the promoters of Kaiparowits plan to handle a similar debasement to the Utah locales affected?

Response: Recognition of the sociological and social psychological problems of impact, i.e. social problems and problems of disorganization which would occur with major projects such as Kaiparowits, has not been discussed in the participants' proposal. It is possible that a "Gillette syndrome" could occur in the new town. Similarly, social problems could - and there is much academic literature to support this - occur in the plateau and quarry impact areas, the transmission line areas and the market area.

(5) Comment: An advisable course to follow at this time would apparently entail as a first step the better understanding of the many alternatives that exist to the proposed Kaiparowits project. It has not been demonstrated that unchecked growth is something we must all live with; in fact, more evidence now

points to the contrary. It has also not been shown that with current reduced growth rates we cannot switch our energy needs to other technologies such as solar power; particularly, in the case of space heating and hot water heating. Estimates of up to a 25% savings in energy requirements in this country have been made by several engineering firms in this country, yet since this conflicts with "business as usual" little is being done in this area by the people in authority.

Response: It is true that alternative energy sources may become available over the next 15 years or so and may reduce the need for additional power plants. However, in the near future a turnaround in technology cannot be effected in time to make possible a significant reduction in the amount of energy required. According to the participants, the electricity must come from somewhere.

30. Arizona Audubon Council

(1) Comment: The Agua Fria River, that portion downstream of Rock Springs, provides the necessary habitat to support the existence of the black hawk - *Buteogallus anthracinus* - of which there are currently estimated to be less than 150 breeding pairs in the United States. The Agua Fria Alternate would have devastating impacts upon the suitability of the lower Agua Fria River to support a black hawk population of any size.

Response: A discussion on the black hawk was added in Chapter II and in the Reference Material binding.

(2) Comment: The draft statement does not deal with the problem of air pollution on a cumulative level, in regards to the Four Corners Region as defined by the Environmental Protection Agency. It is impossible to measure the effects of Kaiparowits upon the Colorado Plateau without studying the emissions of all present and proposed coal generating plants in the area and their effects upon air quality as a whole.

Response: See responses to Rudolph's Comment No. 7 and Janke's Comment No. 2 presented in the Hearings comment section.

(3) Comment: One point I forgot to mention and will forward to Salt Lake in written form was that not only had a transmission corridor been established in the Black Canyon unit but that scenic buffer zone has also been established along the Agua Fria River.

Response: The Black Canyon Trails area and the established utility corridor are discussed in the statement. The utility corridor is described in Chapter II - Land Use Planning. The Black Canyon Trails area is discussed in Chapter VIII under the Agua Fria alternate.

31. Alice T. Anderson

(1) Comment: As a concerned citizen and resident of Johnson Valley, I must register my protest to the Kaiparowits Project. Specifically, I must strongly oppose alternate route "B" as shown on Map 5, Mohave - Devers Route. At the present time there are no high power transmission lines in the area and I feel such lines would cause drastic visual pollution in a very scenic area. I question what criteria was used in determining the scenic value of the Johnson Valley area. I would be happy to tour any member of the Bureau of Land Management through Johnson Valley and then challenge him to justify the "scenic value - slight" classification.

Response: Scenic values for this area were made by a BLM recreation specialist assigned to the transmission system team. It is true that this becomes a judgement decision. The "slight" classification was based upon a comparison with landscape which is judged to be of a higher scenic value in the same general area.

(2) Comment: Have independent studies been done to determine the real needs for additional energy in southern California?

Response: See response to McComb's Comment No. 1, Salt Lake Hearing.

(3) Comment: a) Why can't Utah's coal be gasified?

b) Why can't we develop solar energy? (If all the money that has gone into preparing the draft had been used for solar research, we'd be a giant step down the road.)

Response: Utah's coal can be gasified. The Final EIS contains a discussion of coal gasification. However, in order to generate electricity, the gas obtained from the coal must be burned in conventional fossil-fueled power plants having about the same efficiencies as a coal-fired plant. This means two energy losses, the energy lost in gasifying the coal and the energy lost in converting it to electricity.

Various studies are continuing to develop practical applications of solar energy. This is indicated in the Final EIS. It was determined that practical applications cannot be incorporated fast enough to supply the demand for electricity in the near future.

(4) Comment: c) has the use of underground transmission lines been thoroughly investigated? Won't current technological advances make this a feasible method at around the time the plant and lines would be due for construction?

Response: The use of underground transmission lines was discussed in Chapter VIII, page 208 of the Draft EIS. It is not known whether technological advancements will make this alternative feasible by the time construction begins.

32. James S. Davison

(1) Comment: The Agua Fria alternate transmission route encompasses the area in which I live. I own deeded land with mineral rights with the Agua Fria

alternate study corridor area. There are no conditions under which I would grant Arizona Public Service a right of way. I feel that the Kaiparowits draft statement does not deal with the Agua Fria alternate in a complete full manner.

Response: The text has been revised in the narrative for the Agua Fria alternate including descriptions of the Gila topminnow and black hawk habitat. The effects the line would have on the Black Canyon Trails Area is also described. The line spacing alternate is an alternate to the proposed 2,000- foot separation.

33. Northern Arizona Council of Governments

(1) Comment: No comment on the power plant itself; however, we wish to note that the procedure is wasteful since it will result in the duplication of public facilities where adequate public facilities already exist within a reasonable distance.

Response: The proposal for a new town was presented by the participants and the Kaiparowits Planning and Development Advisory Council; it would require transfer of ownership of lands administered by the Bureau of Land Management. This would be a federal action, which must be analyzed as to impacts according to the National Environmental Policy Act. The adequacy of public facilities nearby, including those in Page, Arizona, is discussed in Chapter III.

34. U.S. Dept. of the Interior, Bureau of Indian Affairs

(1) Comment: This office has reviewed the subject draft statement in the light of our jurisdiction and expertise. The proposed project impinges directly upon the Navajo Reservation only in the location of the Kaiparowits-Navajo, Kaiparowits-Phoenix and Kaiparowits-Moencopi-Mohave transmission lines and the Copper Mine, Preston Mesa and Moencopi microwave stations. The mitigating measures outlined for these areas are adequate for purposes of the draft environmental statement. Should these transmission line routes and microwave station

locations be used, more detailed reclamation and archeological clearance requirements will be specified by this office as a prerequisite of the issuance of the necessary rights-of-way across Indian Land.

Response: BLM recognizes that additional stipulations, not included in the EIS, may be used if proposed lines or microwave stations are located on Indian lands.

(2) Comment: On page I-163 the present owner of the Coppermine Microwave Station location is listed as the Bureau of Land Management. According to the Navajo Tribal Land Administration, the Navajo Tribe is the owner.

Response: Concur. The text has been revised.

35. Robert Kvaas

(1) Comment: First of all, the DEIS is incomplete. The analysis of the alternate uses of the 102,000 acre-feet of water involved and the benefits to society of these alternate uses is inadequate. This is an extremely important consideration in the arid West.

Response: The alternative uses of water discussed has been expanded in Chapter VIII of the FES.

(2) Comment: How many acres of crops could be grown with this much water? What is their economic and social value in an increasingly hungry world? Instead of saving 80,000 barrels of oil a day, how much money could be put into the U.S. treasury by selling the food and agricultural products abroad. The DEIS must consider these questions.

Response: The information requested is found in Chapters VI and VIII of the Final EIS.

(3) Comment: The DEIS is incomplete in another regard. Throughout the statement the impact of the nearby Navajo power plant is almost ignored by stating

that "data is not available to assess the effects of the existing Navajo power plant" ---even though it is already in operation. Let's get out our slide rules and start taking some measurements of air quality in particular. Its effects are already capable of being measured. Any effects resulting from the Kaiparowits plant can be almost doubled by adding the "unknown" impact of the Navajo plant.

Response: The potential interaction between the Navajo power plant and the proposed Kaiparowits power plant is discussed in Chapter VI of the Final EIS.

(4) Comment: The potential for cumulative effects of emissions from these existing or planned generating plants becomes an important consideration. It is interesting to note that a National Oceanographic and Atmospheric Administration (NOAA) model predicts concentrations of sulfur dioxide (SO₂) five to twenty times higher than a study done for Southern Calif. Edison by Intera.

Response: Refer to response to Phillips', Comment No. 1, Hearings section. As indicated in the Draft Statement, there is no universally accepted model for the stable case and the NOAA model represents the upper envelope of expected concentration under stable case assumptions. Additional discussion and data has been added to the Final Statement.

(5) Comment: Another reason the DEIS is inadequate is because no estimates are made of photochemical oxidants (ozone) or carbon monoxide ground level concentrations. It is well known that the 240 tons of nitrogen dioxide (NO₂) emitted each day will react in the atmosphere and create smog and haze. No analysis of the increases in oxidants is made.

Response: Please see response to Spence's Comment Nos. 3 and 4 in the Hearings comments section.

(6) Comment: The sections pertaining to the radioactive elements emitted from the four 600 foot stacks does not take into account radioactive elements

other than thorium-232 and -230, and radium-228 and -226. The radioactivity of the thorium and radium in the coal given in Figure 26a, page II-83 of the DEIS is 100 times greater than the values used in the calculations of emissions. Absent from the analysis are uranium, radon, and other radioactive isotopes of more common elements. These must be analyzed and added to the predictions of the radioactive nuclides emitted.

Response: The table in the draft is in error and should read 1.7×10^{-1} rather than 1.7×10^1 , which accounts for the 100 times discrepancy. This has been corrected in the Final Statement.

The Kaiparowits coal has not been analyzed for other natural emitters in the uranium -238 and thorium -232 series which would be expected to be present in coal. These members would be present in approximately the same concentrations as the daughters that have been determined, in this case Ra-226 or Th-230 or approximately 10.2 picocuries per gram. Consideration of this additional radioactivity would not change the analysis of impacts as discussed in the Final Statement.

(7) Comment: In addition, 1 1/2 tons of fluorine and fluorides would be emitted from the stacks each day. Fluorides are pollutants with considerable potential for producing ecological damage because of the ability of vegetation to accumulate fluorides from low ambient air concentrations.

Response: Please see our response to Crall's Comment No. 1, Hearing section.

(8) Comment: Withdrawal of 50,000 acre-feet a year from Lake Powell would have a salt concentrating effect in the Colorado River, compounding the present salinity problem. It has been estimated that \$483,000 a year in damages to agricultural, municipal, and industrial users on the Lower Colorado River could occur. In the Imperial Valley of California, some land is already becoming

unsuitable for some types of agriculture because of the increasing salinity of the Colorado River. The problem in Mexico is even more severe. Expensive desalination plants (which use energy) are being required. The participants will probably try to double the size of the plant for a total of 6,000 mw to use all of the 102,000 acre-feet of water they have applied for.

Response: The discussion of the effect of the proposed project on Colorado River salinity has been expanded in the Final EIS.

(9) Comment: One might be willing to accept the environmental degradation (which will run into the tens of millions of dollars) if there was established a real need for the electricity produced. Fortunately, the growth in the consumption of electricity is nowhere near the 6.8% forecast by the power companies. Within the last year, it has been closer to 2%, and signs of waste and inefficiency are re-appearing. Even the Federal Energy Administration believes that independent forecasts should be made which are not influenced by the electric utility industry. "think tanks" like the Rand Corp. in Santa Monica are capable of doing a professional and unbiased study of our future needs.

Response: See response to Rudolph's Comment No. 6, Hearing section.

Proposals for reducing the per capita use of electrical power through energy conservation measures will require years to implement, even after a regional or national energy policy is promulgated. Additional sources of electrical power - which may or may not be Kaiparowits - will be needed to meet the interim demand until energy conservation measures begin to show a measurable effect on energy use.

36. Boulder Audubon Society

No response required.

37. U.S. Dept. of the Interior, Bonneville Power Administration

Comment: "dry" should be "Dry" - Second sentence from top of page.

Response: Concur. The text has been revised.

(2) Comment: "Qualify" should be "quantify" - Fourth sentence from top of page.

Response: Concur. The text has been revised.

(3) Comment: The third paragraph states that 490 tons of crude limestone would be converted into 280 tons of lime each day. It is our view that such production of lime will not be possible. The calculations should be redone. The expected handling losses of crude limestone, the provisions for contaminating compounds in the crude limestone, and the expected losses of product lime will make stoichiometric yield of unslaked lime (CaO) from pure limestone (CaCO₃) unlikely. These considerations would lead one to "round off" the quantities to something like 500 tons of limestone per day rather than 490 tons. A simple calculation using the assumptions that crude limestone is CaCO₃ and that unslaked lime is CaO shows that to produce 280 tons of unslaked lime that 500 tons of limestone is required:

$$\text{Tons limestone required} = \frac{100.9}{56.08} \times 280 = 499.7 \text{ tons}$$

Which rounds off to 500 tons satisfying simple stoichiometric relationships.

Response: Concur. The text has been revised to reflect new limestone production quantities.

(4) Comment: "Nipply" should be "Nipple" - Eighth line from top of page.

Response: Concur. The text has been revised.

(5) Comment: The first paragraph under Climate is written in a confusing and contradictory manner. The second sentence is incomplete and the conclusion

that Fourmile Bench has much lower temperatures is not supported by the statement: "Whereas 0°F temperatures are rare at Nipple Bench, during the first year of operation at Fourmile, a December low of 15°F was recorded." Without access to the meteorological reports, one cannot determine just what revisions are in order to end the contradictions.

Response: Concur. The Final Environmental Impact Statement was changed to read - 15°F.

(6) Comment: Next to the last paragraph, last sentence. Will the stagnation periods last for five to seven years and occur seven to eight times every five years?

Response: This sentence should read 5 to 7 days, and not years. This has been corrected in the Final EIS.

38. Clark County Regional Planning Council

(1) Comment: There is concern over the lack of information on the salts and trace elements which will be added to Las Vegas Valley drinking water (Colorado River) by operation of the power plant and coal mine, since we share the same watershed. The EIS acknowledges this lack of information, but that is no remedy for the problem. Prior to the issuance of construction permits, this information must be made available to determine the effects on this regions compliance with EPA water quality standards.

Response: Water quality data are currently being collected from a network of water-quality monitoring stations in the areas that would be impacted by the proposed generating station, coal mines and smoke stack emissions. This program is a cooperative program between the project participants and a consulting firm under contract with EPA (the EPA 208 program). The water-quality data being collected will provide baseline information. Thus, any effects the

project might have on water quality in the Colorado River can be evaluated. Steps may then be taken to alleviate any adverse effects that might be detected.

39. Bridgerland Audubon Society

(1) Comment: Where will water from the power plant come from when Lake Powell has filled with sediments to the point that it is no longer able to supply the water?

What will be the additional impacts of the project to bring in this water?

Response: See responses to Crall's Comment No. 1 and Letter No. 20, Comment No. 1 regarding potential impacts on water. There is no alternate water source should Lake Powell sedimentation occur as you suggest and deny the project the necessary water supply.

(2) Comment: If coal were mined from the Kaiparowits Plateau and transported to Phoenix or Los Angeles to be burned in power plants there, would the environmental impacts be less than the present proposal's impacts? And would energy loss be greater over the proposed transmission lines, or by transporting the coal to be burned near where it would be used?

Response: The consideration of impacts under the circumstances you suggest were not analyzed in the FES, therefore, it would be difficult to make a comparison of Kaiparowits-related impacts with those at Phoenix or Los Angeles. The energy loss of transporting power through transmission lines vs. transporting coal to be burned near the market area is about the same.

40. The Cactus & Succulent Society of America

(1) Comment: The vegetation data, p. 174 in Vol.,II fails to mention what species of cactaceae and crassulaceae will be disturbed in Arizona because of the

transmission lines. Also, we feel that there should be a survey of vegetation that will be eliminated by construction of the powerplant and surrounding complexes.

The Draft should include detailed vegetation maps, not just dominant vegetation distributions, showing exactly where the endangered species are that lie in the way of the powerlines.

Methods of rescuing threatened and endangered species from destruction should be researched and included in the Draft, but preferably, alternate routes should be sought.

Response: Detailed studies of endangered and threatened plant species have not been conducted. However, a detailed vegetative survey is required in Chapter IV, Mitigating Measures, to identify and locate endangered or threatened plant species. This survey could not be completed for the EIS, but would be required before construction begins. Mapping of these species in relation to proposed project construction would also be required. Salvaging and endangered plant relocation are discussed in Chapter IV. Alternative routes are discussed in Chapter VIII.

(2) Comment: It is alarming to note that Toumeya papyracantha (III-147), T. peeblesiana (III-148), and Pediocactus paradinei (Ibid.) are located along the transmission line route. The Smithsonian Report on Endangered and Threatened Species of the United States (House Document No. 94-51, Serial No. 94-A) lists these species as threatened and endangered. Survey work on the distributions of species listed in the Smithsonian Report will begin in the near future and implementation of the proposed powerline routes should be contingent upon completion of survey work of threatened and endangered species to be affected by the Kaiparowits project. If such species cannot be protected, then the Cactus and Succulent Society could organize a rescue operation of cactaceae, transplanting them to other localities out of the way of the powerlines and access roads and/or in to cultivation.

Response: Salvaging of endangered or threatened plant species is mentioned in the Draft EIS in Chapter IV, page 65, and Chapter V, page 33. The survey work of the Smithsonian Report on endangered and threatened species of the United States, published in the Federal Register, as House Document No. 94-51, Serial No. 94-A would be useful, if used in conjunction with site-specific construction work.

(3) Comment: With proposed powerlines extending from Fredonia, along the southern border of the Kaibab Indian Reservation, we would like to know if *Pediocactus sileri* is reported in the vegetation surveys. This species is endangered and is of very limited distribution, endemic only in the above mentioned areas. This species must be pin-pointed in relation to the proposed powerlines.

Response: The exact on-the-ground location of *Pediocactus sileri* is not known. However, this species is known to occur in the area of the proposed transmission lines. This species, along with other endangered and threatened species, would be mapped prior to beginning construction. This requirement is contained in Chapter IV, Mitigating Measures.

41. Northern Arizona University, Department of Biological Sciences

(1) Comment: The time available for comment does not permit a complete reading of this large document, but I feel compelled to mention one erroneous statement. On page III-67, it states, "There is no known information regarding the soil micro-organisms presently in the soil and therefore subsequent impacts would be strictly theoretical and possibly invalid."

The following three reports provide data on soil micro-organisms of the area and discuss their significance.

(1) Navajo Generating Station Ecological Baseline Studies. Annual Report. 1 June 1971 - 31 May 1972. Northern Arizona University. Flagstaff, Arizona. 282p. NTIS Accession No. PB 242843.

(2) Environmental Impact Studies of the Navajo and Kaiparowits Power Plants. Second Annual Report. 1 June 1972 - 31 May 1973. Northern Arizona University. Flagstaff, Arizona. 260p. NTIS Accession No. 242846.

(3) Supplemental Environmental Studies of the Kaiparowits Generating Station. May 1973. Northern Arizona University. Flagstaff, Arizona. 28p. NTIS Accession No. 242844.

Further information on the functional interrelationships between the micro-organisms and their environment, as well as their response to simulated power plant effluent is included in the following reference, and will also be discussed in our next annual report:

Environmental Impact Studies of the Navajo and Kaiparowits Power Plants. Third Annual Report. 1 June 1973 - 31 May 1974. Volume 1. Northern Arizona University. Flagstaff, Arizona. 390p. NTIS Accession No. 242845.

Response: We have reviewed these reports and find that they contain listings of various species of lichens and fungi that are found in the soils, but no listings of soil bacteria. These studies relate the presence of fungi to kinds and amounts of organic matter, but are vague on the actual effects of pollutants on fungi and lichens. For clarification, however, the sentence as discussed and located on page III-67 of the DES has been revised.

42. Arizona State Clearinghouse

No response required.

43. Arizona Archaeological Society

No response required.

44. Robert H. Thompson

(1) Comment: What happens if pollution control equipment fails to operate at planned efficiency?

Response: See response to Dr. Spence's Comment No. 1 in the Hearings comments section.

(2) Comment: The BLM has a public responsibility to disclose negative social and economic impacts to small southern Utah communities. The public opinion poll in pages III-273-275 indicates a very shallow understanding of these impacts. Positive factors have received much attention as a result of the public relations efforts of the power companies.

Response: The text of Chapter III, Socioeconomic Section, has been revised to reflect impacts on small communities in southern Utah. See response to Swenson's Comments No. 1, Hearings comments section.

(3) Comment: In reviewing the environmental problems related to the plant it would seem obvious that study of alternate plant sites closer to load centers is a critical consideration. As long as the plant site remains in the highly scenic canyon country of the Colorado Plateau controversy will continue far into the future.

Greater attention should be paid to effects of alternate energy sources and energy conservation.

Response: The sections on plant siting, substitute fuels, and other uses for coal and water in Chapter VIII have been expanded. Alternate energy sources and energy conservation are also discussed in the expanded text.

45. Plateau Sciences Society

No response required.

46. Arizona Wildlife Federation

(1) Comment: We, therefore, challenge the participants of the Kaiparowits project through the BLM and NEPA process to produce documented evidence that, "if a third line is required, it will be separated by a distance equal to, or greater than, the longest span length per the line sections involved (about 2,000 feet), IF POSSIBLE". (Emphasis added - page I-159) We suggest that this evidence be in the form of disrupted service data for similar geographic regions which the proposed transmission lines would cross.

Response: The 2,000 foot separation is discussed in Chapter VIII under the heading 2,000-foot separation. The "separation" question is also discussed as an alternative to the proposal.

47. U.S. Dept. of the Interior, Bonneville Power Administration

(1) Comment: Chapter III. Pages 147, 148, and 149. The discussion helps the reader to understand the rare and endangered plant problem, however, maps showing the likely locations would be helpful to the reader.

Response: Detailed surveys showing endangered and threatened plant species have not been conducted. Therefore, it is impossible to map or delineate areas showing locations of these plant species.

(2) Comment: Page 290. The number of statistics on the page could be reduced by eliminating the plus or minus percentages.

Response: Elimination of the plus or minus percentages would reduce the number of statistics on the page; however, a reduction in the statistics displayed would have to be weighed against elimination of statistical reliability indices needed for valid interpretation of the public opinion poll.

(3) Comment: Chapter IV-I. Center of page. "Any loss of human life would unquestionably be an irreversible, irretrievable commitment." Since loss of human life is always irreversible and irretrievable, why must this be stated?

Response: The irreversible and irretrievable commitment of Resources section, Chapter VII, of the EIS, discusses loss of human life resulting from construction and operation of the power plant and coal mine. It is a known fact that deaths will occur. For example, statistics show that underground coal mining is the most hazardous industry in the United States (United Mine Workers Journal, 1974). Data for the first half of 1974 show that one underground mining fatality occurred for each 4 million tons of coal mined and that one fatality occurred for each 21 million tons of coal transported or processed on the surface (Health and Safety Analysis Center, 1974). These fatalities must be discussed if the project is allowed to proceed since they involve the commitment of human resources.

(4) Comment: Figures 5 and 10 (pg. II-27 and II-34), pertaining to air quality sampling, do not indicate where the samples were taken. There may be more such omissions.

Response: Concur. The text has been revised.

48. Mineralogical Society of Utah

No response required.

49. Jeffrey L. Dawson

(1) Comment: The section on air pollution may be incomplete, if the hearing testimony of Michael Williams of the Lake Powell Project is correct. If it is possible that air pollution concentrations may be considerably more than estimated in the draft statement, this should certainly be investigated.

Response: See our response to Viavant's Comment No. 1 in Hearings comments section.

(2) Comment: Since the Kaiparowits project is only one of five large power generating plants planned for the area, it is obvious that it should not really be considered in isolation. At minimum, some mention should be made of the magnification of harmful impacts if the other projects are approved; but it would be best if a regional energy planning and environmental impact study were made before any further action is taken.

Response: See response to Rudolph's Comment No. 7 and Janke's Comment No. 2, Hearings section.

50. Mary Anne Mark

(1) Comment: Even a preliminary analysis, however, indicates that the DEIS is not adequate. It is generally conceded, for example, that air quality and particularly visibility reduction is of critical importance in this region. On the issue of visibility, the EIS presents a brief, uncritical summary of a study prepared by the Bechtel Power Corporation for one of the applicants. This is totally useless for public analysis. The EIS does not consider the cumulative effects of industrialization in the entire region.

Response: The question of visibility has been addressed in Chapter III of the Final EIS with the inclusion of new data. Regarding the cumulative effects of industrialization, data on the Navajo power plant has also been included in Chapter VI of the Final EIS. See responses to Rudolph's Comment No. 7 and Janke's Comment No. 2 presented in the Hearings comments section.

(2) Comment: The Draft EIS virtually dismisses without discussion the potential impacts on the nationally significant Paria Canyon Primitive Area and

the proposed Escalante Wilderness. In fact, on the map of "Scenic Quality" (page II-301), both are mapped as areas of "slight scenic quality." The quality of maps throughout the EIS is so poor as to make them almost useless.

Response: The impacts on Paria Canyon Primitive Area and the Escalante River Drainage are specifically mentioned on page III-203. The Scenic Quality map (Illustration 47) shows the scenic quality of Paria Canyon as outstanding. The Escalante River Area is not shown on the map.

51. U.S. Dept. of the Interior, National Park Service

(1) Comment: The statement should document consultation with the four State Historic Preservation Officers involved, specifically stating whether or not there are sites in the various project areas which may be on or eligible for inclusion on the National Register of Historic Places. Since a number of sites have been identified (pp. II-242 to II-285) which appear to be eligible for National Register designation, a request for a determination of eligibility for inclusion on the National Register of Historic Places should be referred to the Assistant Director, Office of Archaeology and Historic Preservation, National Park Service. For sites listed on or eligible for inclusion on the National Register as a result of the above consultation, the Bureau of Land Management and the State Historic Preservation Officer should apply the "Criteria for Effect" as set forth in the Advisory Council on Historic Preservation "Procedures for the Protection of Historic and Cultural Properties."

Response: Documentation of State Historic Preservation Officer consultations were discussed in Chapter III, pp. 195-6, of the Draft Statement. Applicable correspondence has been added in Chapter IX, Consultation and Coordination, of the Final Statement.

A request for determination of eligibility would be premature prior to an intensive survey once siting decisions have been made.

Application of Criteria of Effect cannot be done before siting decisions are made.

(2) Comment: Surveys appear to have been completed on a small portion (10 percent of the impact area, p. II-246). In order to identify potentially significant cultural resources, it will be necessary to conduct a complete archaeological field reconnaissance survey of all project lands.

Response: A complete archaeological survey has been specified in Mitigating Measures, Chapter IV.

(3) Comment: The statement should describe and reference the archeologists' findings and recommendations pertaining to the need for further research.

The final environmental statement should present procedures to be implemented in the event previously unknown cultural resources are encountered during project construction. It should reflect compliance with Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800).

Response: Archaeologists' findings and recommendations are discussed in Chapters II and III, and are implicit in Chapter IV. Additional, more detailed, site data is on file with the BLM. Procedures on how to deal with construction discovery of cultural resources are included in Mitigating Measures, Chapter IV.

(4) Comment: Progressive deterioration of air quality in the Four Corners region is a cumulative impact of increasing development. Individual projects may make relatively minor contributions to the total pollution level, but collectively their effects are severe. The impacts of the proposed plant appear to have been

analyzed without regard to the air quality deterioration that has already taken place, is now taking place, and will continue to take place as a cumulative impact of energy development in the region. With respect to each of the affected parks, the environmental statement would be substantially improved by an assessment of (1) the contribution of energy development projects to air pollution levels during the recent past, (2) the absolute and relative contribution of the proposed plant to air pollution under the most unfavorable meteorological conditions, and (3) the relative significance of air pollution from the proposed plant with respect to energy development projects planned for future implementation.

Response: See responses to Rudolph's Comment No. 7 and Janke's Comment No. 2 in the Hearings comments section. Also, see Interrelationship section of Chapter I and VI, Air Quality section.

(5) Comment: We do not agree with the "Low" rating given for the degree of aesthetic impact from Rainbow Point Overlook, Bryce Canyon National Park (Figure 4, p. III-205). In fact, the Four-Mile Bench is visible from all major overlooks. However, only Rainbow Point is mentioned in the statement. The overview will be affected by the visual impact of the plant complex and by decreased visibility due to stack emissions.

Response: The low rating is valid for the following reason. The rating measures the relative visual impact of the physical facilities at the plant site, not the visual impact of the stack emissions (stack emissions are covered in Chapter III). At a distance of 32 miles, the plant complex would blend into the gray background of Smoky Mountain and Fiftymile Mountain.

(6) Comment: II-195, map on crucial game habitat - This map is fragmentary; many areas were omitted. Antelope occur in northern Mohave County, Arizona, and on the Coconino Plateau northwest of Williams, Arizona.

Mule deer occur in the Kaibab National Forest and on the Shivwits Plateau areas. These populations are known nationwide for producing most of the outstanding trophies of Boone and Crockett Registry quality for the State of Arizona.

Elk occur on the Hualapai Indian Reservation.

Mountain lion occur along the Colorado River from the Grand Wash Cliffs to at least as far upstream as House Rock Valley as well as throughout the Kaibab National Forest.

A herd of bison ranges south of the Vermilion Cliffs in Coconino County.

Desert bighorn occur throughout the Grand Canyon from the Grand Wash Cliffs to the upper part of Grand Canyon National Park as well as in many areas along the lower Colorado River. The distribution shown on the map, p. II-197, has several errors, however. Bighorn are shown on the south half of the Hualapai Indian Reservation where they do not occur, but are omitted from the north side of the Colorado River where they occur from the Grand Wash Cliffs upstream to at least Phantom Ranch. They also occur on both sides of Lake Mead upstream from the Overton Arm.

Raptor nesting occurs throughout the Grand Canyon.

Wild turkey occur in the canyons between the Shivwits Plateau and the Colorado River, as well as on the Hualapai Indian Reservation and the Kaibab National Forest.

Response: Concur. The text has been revised.

(7) Comment: There are several references to the possibility of drying up or contamination of springs in both the limestone quarry area and coal mines. There is nothing in the statement which mentions what will be done to provide suitable water sources for use by domestic stock and/or wildlife. For any natural water source that is disrupted, alternate sources of potable water should be developed.

Response: The participants' proposed actions failed to provide any alternate sources of potable water should natural sources be disrupted. Therefore, this item was not discussed in Chapter I. The participants have not provided for this item in Chapter IV, Mitigating Measures.

(8) Comment: The mercury discharge section primarily addresses the sport fishery of Lake Powell. Consideration should be given to the possible effects of this discharge on Bryce National Park and local communities in Bryce Valley.

Response: There are insufficient data from which to evaluate the potential impact on Bryce Canyon National Park and communities in Bryce Valley. Principal concern about mercury stems from fallout from stack emissions onto local drainage basins immediately tributary to Lake Powell. Information on prevailing winds indicate that stack emissions from the power plant would not be carried into the Bryce Canyon area except perhaps on rare occasions.

(9) Comment: There is the potential for a multiplicity of transmission lines, even beyond those proposed for Kaiparowits, paralleling the existing line through the Arizona Strip in front of Pipe Spring National Monument. No alternate route has been developed, or studied, which would place the proposed corridor further south in the strip and possibly out of sight in Pipe Spring.

Response: This transmission line corridor was established as a utility corridor through the Bureau of Land Management planning system and public meetings.

(10) Comment: Canaan Peak is identified as a potentially viable alternative for a limestone source. There is no evidence that impacts associated with the Canaan Peak site have been thoroughly examined with respect to those of the proposed Johns Valley site. The Johns Valley proposal will have adverse impacts on Bryce Canyon National Park. Increased air, noise, and water pollution will affect the northern part of the park, which is transected by Utah Route 12. This

highway will be used by limestone hauling trucks (estimated 30 trips per day) and oil tankers, as well as increased numbers of conventional vehicles. Traffic congestion will inconvenience park visitors, impair aesthetics and the visitor's experience, and create public pressure to construct passing lanes. Upgrading of the road system, if implemented, would have direct adverse impacts on park resources. Use of the Canaan Peak site would eliminate impacts on the park that are associated with haulage on Route 12.

Response: Chapter III discusses the impacts of the limestone quarry if it were located at Johns Valley. Chapter VIII discusses the Canaan Peak alternative and compares the impacts of the two sites.

(11) Comment: There remains an apparent gap in planning in the initial phase of construction. The planned stages of implementation (beginning on page I-270) indicate that the first route of access to the plant and minesite would be from the north. This would apparently continue to be the principal route of access for equipment and material during the entire construction phase and, although it is not said specifically, it is implied that housing for construction workers would be in a camp-type facility near the plantsite. There is no apparent sequencing of the Clark Bench town or access from the south into the construction site. As indicated on page I-274, once the decision to construct the southern access route is reached, it will require a year to design it and 1 1/2 years to build it. Even if it was assumed that the design was accomplished during the interim, pending final Departmental clearance for the project and issuance of permits, it is doubtful that construction of that road could begin before clearance for plant construction was obtained. It could be expected then that the project would be 1 1/2 years into construction before the southern access route was finished.

During that period the table on page I-272 indicates that between 761 and 1,667 workers would be employed at the plantsite, the mine, and the limestone quarry. This is as much as half the total projected employment on the site, although comprised of construction rather than operations personnel. It appears that patterns of residence, services, commercial centers, and transportation will be established by the initial work.

Response: The route from the north would be for heavy equipment. A rough graded road following the proposed new highway would be used for access from the proposed East Clark Bench townsite. The Utah State Department of Highways has already started design of the new highway. Refer to "Generating Plant Construction Access" in Chapter I of the Final EIS.

(12) Comment: The viability of the contingency housing plans discussed on pages I-306 to I-312 is dependent on the availability of road access from East Clark Bench to the plant, mine, and quarry sites. There is no apparent recognition of this in the proposal.

Response: The participants indicated that a construction camp might be provided at some location other than the proposed townsite; that contingency housing may be developed at the proposed townsite at the southern end of the proposed highway, and haul roads and a new highway would be improved and started, respectively, in the first phase of construction, to provide access (see pages I-270-271, 310, 329, and 335-338 of the Draft Statement). However, it is also noted in the Draft Statement on page III-264 that roads may not be finished before they are needed, and workers may have to travel on dirt roads. Some may live on private lots, with some subsequent impacts.

(13) Comment: There is little mention that Kaiparowits coal is a national resource, deserving efficient and extended use. The alternative of reducing the scale of the project to extend the lifetime of the coal beyond 35 years should be considered.

Response: The participants have proposed construction of a power plant with four 750-MW units on a staggered construction schedule. They presented an estimate of their plans based on power demand projections and anticipated power needs. It is entirely possible that the implementation of a national energy policy, reduced percapita use of electricity, higher costs, or other factors may delay construction schedules. One or more of the four units may never be needed. These actions, which could result in reduced adverse impacts on the environment and reduced use of natural resources, should remain an option of the participants. Therefore, they have not been discussed in detail in the EIS.

(14) Comment: Plans for reclamation of the plantsite and support facilities, including removal of structures, conveyors, transmission lines, lift stations, roads, etc. to be implemented when the plant has served its usefulness, should be described.

Response: At this time, the participating companies have no plans to remove any of the structures upon retirement of the generating station. It should be noted that the plant could operate anywhere from 35 to 70+ years. It would be difficult to formulate any plans for removal of these structures at this time.

(15) Comment: Illustration No. 1 (p. I-5) - The impact area does not include Bryce Canyon National Park. The proposed generator site, or portions of such, would be visible to Bryce Canyon National Park and, therefore, would pose a visual intrusion or impact.

Illustration No. 3 (p. I-9) - Zion National Park is included on the map but Bryce Canyon National Park, within visual distance of the generating plant, is not. We believe Illustrations 1 and 3 should be corrected.

Response: Illustration No. I-1 has been revised. The purpose of Illustration No. I-3 is to show transmission routes, not impact areas associated with the power plants. Illustration I-3 is Illustration I-4 in the FES.

(16) Comment: There is ambiguity relating to water use. In Chapter I, Figure 1, the value is 50,400 acre-feet per year, twice as much as mentioned on page 13 of Chapter I, and on page 9 of Chapter VIII.

Response: The water contract held by the participants is for 102,000 acre feet per year. The 50,400 acre feet per year is the amount to be consumed by the power plant and mine each year. See page I-85 in the Draft EIS.

(17) Comment: In Chapter III, page 2, calculated SO₂ emissions are deemed within standards for Class II areas. It is not clear, however, what part of the time SO₂ scrubbers will operate at design efficiency. What is the record with operating plants?

Response: Refer to Spence's Comment No. 1 in the Hearings section.

52. Dept. of the Army, Corps of Engineers

(1) Comment: The ash disposal area and adjacent drainage system, the mine tailings and pond, and the runoff evaporation pond, as indicated on page V-28, are not to be maintained following the end of the projected 35 year life of the proposed project. These facilities should be monitored and maintained following the project completion to ensure that contaminants from the facilities do not reach Lake Powell.

Response: See response to Letter No. 20, Comment No. 3.

(2) Comment: Outlined on page I-323 are the Corps of Engineers responsibilities. In addition to the Section 10 navigation permits mentioned, the Corps has jurisdiction regarding discharge of dredged or fill material into streams as required by Section 404 of the 1972 FWPCA. The Corps' regulations under Section 404 are fully described in the Federal Register, Volume 40 - Number 144, Part IV dated 25 July 1975. In effect, the permit procedures were expanded on 25 July 1975 to cover wetlands adjacent to navigable waterways of the

United States. Effective 1 July 1976 the regulation will also apply to discharges of dredged or fill material into primary tributaries of navigable waters, and all bodies of standing water created by the impounding of water of the United States. Subsequently, after 1 July 1977 the regulation will extend into secondary tributaries of navigable waters downstream from the point where the flow exceeds 5 cubic feet per second. Placement of fill material associated with construction of any structure in such waters is covered by the program.

Response: The text has been revised to include this information.

53. El Paso Natural Gas Company

Comment: The table on page I-351 (Figure 54) needs the following corrections:

(a) The "Participant Column" should use "El Paso Company" instead of "El Paso Gas."

(b) The size and proposed date for commercial operation should be as follows:

Burnham I	288 Million SCFD	1978
	325 Million SCFD	1979
Burnham II	288 Million SCFD	1980
	460 Million SCFD	1981

Response: Concur. The text has been revised.

54. U.S. Dept. of the Interior, Mining Enforcement and Safety Administration
No response required.

55. Western Municipal Water District of Riverside County
No response required.

56. Arizona Game & Fish Department

(1) Comment: We are concerned with the possibility of smoke drifting down the Colorado River into the Grand Canyon. We are of the opinion that it would be ridiculous and ludicrous for the American people to permit a smog problem in the Grand Canyon. It is possible that the proposed project might create a permanent haze over the entire Lake Powell-Grand Canyon region, making it the most polluted nonurban area in the country. A total of five coal-burning plants are proposed for the area. The cumulative effects of these and the existing plants were not taken into consideration in the DES.

Response: The Final Statement indicates that, based on predictive models of visibility, the potential exists for visibility reduction in the Grand Canyon area. A person at Grand Canyon looking north along the plume axis could have visual range reduced by approximately 20 percent with visibility reduction along other lines being insignificant. Meteorological conditions of humidity, wind, atmospheric stability and persistence necessary to transport the plume were estimated to occur less than 5 percent of the time.

The Final Impact Statement considers further the cumulative effect with the Navajo plant at Page. The other proposed power plant was not considered for reasons cited in our response to Rudolph's Comment No. 7 and Janke's Comment No. 2 in the Hearings section.

(2) Comment: Perhaps the most potential detrimental aspects of the proposed Kaiparowits project in Arizona would be the effects on wildlife habitat caused by the construction of transmission lines. These lines would invade pristine country that is presently inaccessible for the most part. If the Kaiparowits project continues as proposed in the DES, we would hope that some wildlife biologists and evaluators come from the states effected to determine the transmission line routes.

Response: The authorized BLM official would be in contact with the Arizona Game and Fish Department throughout construction of the project.

(3) Comment: We would be extremely concerned with the placement of this many miles of access roads into pristine areas. Previously undisturbed areas would be left open to human intrusion and encroachment. In addition, past experience has demonstrated that access roads invariably lead to more access roads. A dendritic pattern is usually created that eventually subdivides and mars the country. A point is reached where the habitat is reduced in quality for much of the wildlife. One of our big concerns is that the DES failed to discuss where along the transmission lines these access roads would be established. They could be constructed in very critical wildlife or scenic areas.

Response: The access roads would be aligned with the help of BLM officials, the authorized officer, archaeologist, and wildlife biologist.

(4) Comment: This proposed transmission line would pass through good wildlife habitat from the northern boundary of the Kaibab National Forest ten miles northwest of Williams south to New River. Several better alternatives exist to the west of the mountains and mesas of the proposed alignment. Routes farther west in Chino Valley should be considered.

Response: Several other alternative routes were evaluated. When all resource values and potential impacts of the alternatives were compared with those of the proposed route, they were eliminated from further consideration. The criteria for selection of viable alternatives is to identify and analyze those routes which would have less potential impact upon the environment than the proposed route. In this instance, BLM determined that the proposed route was the best selection from an environmental standpoint.

(5) Comment: Paralleling the proposed Kaiparowits-Moenkopi-Mohave transmission line route in the early stages west as far as Chino Valley and then

turning south through Chino Valley would be a better route. Another alternative not considered would be to follow the existing route to Highway 66 and then follow the highway east to Chino Valley and turn south through that valley. By far the least destructive route south of Chino Valley would be the one paralleling Interstate 17 from Cordes Junction south to New River.

Response: The routes as mentioned were evaluated and discarded by the EIS staff resource analyst. These routes proved to be more environmentally destructive since many miles of new 500 kV transmission line corridor would be opened through the Chino Valley area. The proposed route along an existing 500 kV corridor appears to be the least environmentally damaging.

(6) Comment: The existing twin 500 kV Navajo transmission lines would parallel 2,000 feet from the proposed Kaiparowits-Phoenix route. Those lines have already had excessive adverse impacts upon mule deer and antelope herds on Sycamore, Perry's, and Black Mesas. They also cross critical antelope, deer, and elk wintering range north and south of Highway 66 near Williams. Another 500 kV power line 2,000 feet away from the existing 500 kV power lines would only add to the burden on wildlife. The 2,000-foot separation would require building as much new access road as was required for the two Navajo lines. New transmission lines should be placed as close as possible to existing power lines so that existing access roads can be used. It is true that hunter access would be improved, but hunting success would decline due to the reduced animal populations. This has been the case on Perry's Mesa as a result of excessive pressure placed on the mule deer herd as a result of the Navajo line access road.

Response: The 2,000-foot separation is discussed in Chapter VIII. The miles of new access road are listed for each proposal.

(7) Comment: It would appear from reading the DES that all of Arizona west of State Route 64 is a wildlife desert that contains only a small area of elk

habitat. The "crucial" elk habitat outlined on the map in Volume II-195 east of the Hualapai Indian Reservation contains no elk. However, elk, do occur on the Hualapai Indian Reservation. Antelope inhabit most of the route from Highway 64 to the Cottonwood Cliffs. As a matter of fact, this portion of the proposed route crosses one of the most important antelope ranges in Arizona. This area is also probably one of the best trophy buck hunting areas in the west. Since antelope are not identified as occurring in this area, no impacts on the animals are considered nor any mitigating measures recommended. The DES gave no information on antelope that could be used to make rational decisions.

Mule deer occur in a discontinuous manner throughout the proposed route from Highway 64 to the Colorado River. They were not considered or even mentioned in the report; however, they occur in the pinyon-juniper vegetative type between Highway 64 and the Hualapai Reservation. Mule deer can also be found in the Cottonwood, Peacock, and Hualapai Mountain Ranges. The Peacock and Hualapai Mountains produce a sizable portion of the northern Arizona legal buck harvest. This species is a very important game animal throughout the proposed route from Highway 64 to Kingman.

Mountain lions in the DES were designated only as possible transient inhabitants of the Cottonwood Cliffs. On the contrary, they are residents in the Cottonwood, Peacock, Hualapai, and Black Mountain Ranges; additionally, they are found in the more rugged areas between Highway 64 and the Hualapai Indian Reservation. The Music Mountain-Cottonwood Mountain-Aquarius Mountain complex probably supports one of the largest mountain lion populations in Arizona.

Desert bighorn sheep constitute year-long residents along the proposed route in the Black Mountains. This is not just a migration route. Though bighorns were mentioned as occurring here, there was no consideration of these sheep when the impact of the line was discussed. This species is unique, is very sensitive to disturbance, and occupies shrinking habitat. It deserved better consideration in the DES.

Response: Concur. The text has been revised and additional information has been added to the Final EIS.

(8) Comment: Mourning doves are year-long residents of the Mohave desert. Gambel's quail occur along the entire proposed route from Highway 64 to the Colorado River in all three mentioned vegetative types. The reader gets the impression from Volume II-204 that this species does not occur in the pinyon-juniper or desert grassland vegetative types.

Most of the vegetation in the desert bighorn sheep range is climax, not lower successional stages as inferred in Volume III-163.

Response: Concur. The text has been revised.

(9) Comment: The major objection that we have to the proposed Moenkopi-Mohave route is the section that crosses new country from the Hualapai Reservation to the Cottonwood Cliffs. This area presently contains several roads that provide adequate access. We do not favor another road there.

If this transmission line must be built, we would prefer that it follow the Mohave Generating Station coal slurry line. The slurry line passes near the Moenkopi switching station and goes directly to the Mohave switching station. The line currently has a good access road along the entire length and considerable right-of-way has been cleared. This should minimize the vegetation disturbance necessary to build the proposed power line.

Some of the more scenic areas that would be affected by the proposed route are the Aubrey Cliffs, the Grand Wash Cliffs, and Red Lake.

Response: Coal slurry routing has been proposed as an alternate in Chapter VIII.

(10) Comment: Possibly one of the best alternates for the proposed coal-fired plant in terms of environmental preservation would be the construction of a

coal gasification plant on the Kaiparowits Plateau. The coal deposits of the area could still be utilized.

A coal-gasification plant would eliminate the need for habitat degrading transmission lines with their access roads. The gas produced could be shipped out through underground pipelines, which could follow existing pipeline corridors. Southern California has the facilities to burn gas, so this would not create a problem.

The amount of air pollution would be considerably less with a coal gasification plant. Arizona does not want polluted air any more than Southern California. A plant of this type would prevent the many scenic wonders of the area from becoming encased in a pall of smoke. In addition, the threat of mercury pollution would be reduced in Lake Powell.

The water efficiency of a coal gasification plant is apparently much better than that associated with the operation of a coal fired plant, according to Mr. Harold Sersland, Bureau of Reclamation, Salt Lake City, Utah (telephone conversation, 9-29-75).

Response: A section on coal gasification has been added to the alternatives in the Final EIS. While the points presented by the Department are valid, coal gasification would use about 1-1/2 times the coal and 40 percent of the water to achieve the same Btu value in the gas produced, obtain about 85 percent of the ash, 32 percent of the SO_2 , 8 percent of the NO_x , and about 32 percent of the particulates. If the gas were to be used for power production elsewhere, about the same amount of NO_x would be produced and about the same amount of water used as for a 3,000 MW coal-fired plant. There remains the possibility, however, that some of the gas might be diverted into direct commercial and residential heating in place of electrical resistance heating. Also, see response to Letter No. 31, Comment No. 3.

57. Arizona Lung Association

Comment: The Impact Statement on the Kaiparowits Project contains virtually no substantive section on the health effects of air pollution generated as a result of the project. It is a serious omission and thus should not be acceptable. Medical and scientific data is being released almost monthly on the effects of excessive air pollution on lung disease patients, on the elderly, or on asthmatics and small children. Impact statements, including Kaiparowits, have little else but historic significance in light of the rapidity of newly discovered scientific information.

Response: Health effects are discussed in the Air Quality section, Chapter III of the FES.

58. U.S. Dept. of Commerce, The Assistant Secretary for Science & Technology

Comment: The hazards to life and property from flooding are recognized on pages I-325, I-328 and II-140, but no reference is made to the availability of weather forecasts nor of warnings of flash floods by the National Weather Service.

Response: Weather Bureau data was used to develop runoff estimates for 2-year and 50-year storms of 6 hour duration. The Kaiparowits area is isolated and far removed from Salt Lake City and Milford, Utah. It is subjected to storm patterns similar to the Southwest, which are localized and high intensity for short duration during summer months, and unlike the rest of Utah. Therefore, it would be difficult to accurately forecast or give warnings of flash floods.

59. Southern California Association of Governments

(1) Comment: It is suggested, however, that to mitigate possible environmental impacts in the roadless areas of Cleveland National Forest, wherever possible helicopters should be used during the construction of the system and for its maintenance, rather than constructing access roads.

Response: See response to Letter No. 5, Comment No. 1.

(2) Comment: Based upon past examples of environmental degradation that have occurred with unrestricted recreational use, it is strongly recommended that mitigation measures be provided to reduce this environmental degradation.

Response: These mitigating measures would require enforcement of applicable federal and state laws. Federal regulations apply to National Park lands and public domain whereas private and state lands come under the jurisdiction of county and state governments.

(3) Comment: What are the specific factors and assumptions that are considered in forecasting energy demand for Southern California and how can these factors be evaluated in terms of adopted regional policies? In this vein, how would changes in consumption patterns (such as recent examples of voluntary conservation of energy or the possibility of government enforced conservation) affect the amount of energy needed in Southern California and how would this affect the needed scheduling of generating facilities?

How much reserve capacity do the utilities currently have and how much do they need?

Once information is available regarding the projected demand for energy, the following types of questions should be answered regarding the proposed supply of energy so that an overall picture can be developed:

What are the projects currently being proposed and where are they located?

What is the total proposed generating capacity and what would be the relationship of this source of energy to other sources currently available (e.g., what effect would these projects have on the need for petroleum or natural gas?).

What energy and environmental resources (and in what quantity) would be used to generate this additional energy?

Which jurisdictions, and how many people in these jurisdictions, would the plants serve?

What are the environmental impacts of one proposed project and/or a series of projects vis-a-vis the other projects that are being considered and which projects would have the least detrimental environmental impact? Further, what are the relative needs and impacts of the projects (i.e., could the construction of one plant in a relatively isolated area replace another project which would have greater environmental and social impacts on the population?).

Response: Chapter I of the FES contains data regarding the projected demand forecasts for the Southern California market area. Reserve capacities are also discussed in Chapter I. The regional issue you raise is answered by our response to Rudolph's Comment No. 7 and Janke's Comment No. 2, Hearing section.

60. Arizona Mining Association

No response required.

61. Corona Chamber of Commerce

No response required.

62. U.S. Dept. of Transportation, Federal Highway Administration

Comment: Our Division Office in Salt Lake City has worked closely with the local BLM Office during final preparation of the DEIS and had some input into the document. Copies of three memorandums sent to you and your reply are attached for your reference. Our concern with the statement has been that it should address environmental considerations of the access road, as well as project circulatory roads, sufficiently that no further environmental statement would be necessary in the event Federal Highway administered funds later become

available for road construction. As part of this effort, we have accepted BLM as the lead agency for EIS preparation as provided by FHPM 7-7-2, paragraph 7.

Our Division Office memorandum of May 20, 1975, suggested the environmental impacts of the access road were not covered. When the DEIS was published, the impacts still were not covered. Our Division Office has discussed this matter with BLM representatives and followed up with their September 10, 1975, memorandum. We understand you are in agreement that the access road impacts should be covered and also agree that due to oversight, they have not been, but will be included in the final EIS.

Response: The environmental impacts resulting from the construction and maintenance of the new highway and access roads have been discussed and are included in the Final EIS.

63. U.S. Dept. of Transportation, Federal Aviation Administration

(1) Comment: Since the draft does not indicate the exact location of the power transmission lines, it is difficult to determine the effect on our facilities. Therefore, we recommend that the Department of Interior obtain the locations of all electronic facilities from Electromagnetic Compatibility Analysis Center (ECAC), North Severn, Annapolis, MD, 21407 (phone: 301 267-2415). ECAC can furnish the effect that the power transmission lines will have on the electronic facilities provided the Department of Interior furnishes the coordinates for the power transmission lines. We would like to have a copy of the report from ECAC to verify the effects on our facilities.

Response: A contact has been made with the ECAC to provide the report that FAA requests.

(2) Comment: Re Chapter V, page 59. The FAA has no record of an airport existing at Glendale, Nevada. The Glen Ivy Hot Springs airport has been abandoned.

Response: Although FAA does not have a record of it, there is a small private airport at Glendale, Nevada. This information was added in the FES.

(3) Comment: An Airport System Plan for Clark County Nevada that was completed by the County in December 1974, identified the El Dorado Valley as a potential site for an airport to serve the Las Vegas Area. A Master Planning effort is underway to determine if McCarran Field at Las Vegas is capable of expansion to accommodate the forecasted demands of Clark County. In addition, the National Airport System Plan recommends a new airport to serve Boulder City, Nevada. Although a site has not been selected, a location in El Dorado Valley may be under consideration. Since the decision to locate and develop airports rests with the local governments, it is suggested that the officials of Clark County and Boulder City, Nevada be consulted to determine if the proposed transmission lines would conflict with their proposed airport planning.

Response: Since a specific site for the Eldorado Valley Airport has not been selected at this time and it probably won't be constructed for 10 to 20 years, the specific impacts resulting from new transmission lines in the area cannot be accurately assessed. However, the EIS does identify the possibility that new lines, especially alternates creating a new corridor in Eldorado Valley, could conflict with future siting of an airport. Also, refer to Land-use Chapters III and V and the Railroad Pass Alternate Chapter VIII.

64. The Cactus & Succulent Society of America

(1) Comment: On behalf of the Cactus and Succulent Society of America, I would like to express concern in regard to the Kaiparowits Environmental Impact Statement Draft's treatment of native vegetation. It has come to our attention that there are some native cacti growing in the area to be spanned by the proposed Kaiparowits transmission lines; namely small globular cacti of the

genus Pediocactus. Some of these cacti are listed in the Smithsonian Institution's Report on Endangered and Threatened Plant Species of the United States, House Document No. 94-51, Serial No. 94-A. We were quite shocked to learn that the Kaiparowits Draft, vol. III, pp. 147-148, lists three pediocacti thought to be located along the transmission line route. These are: Pediocactus (Toumeya) papyracanthus, P.(Toumeya) peeblesianus, and P. paradinei. The Smithsonian Report (p.54) lists P. peeblesianus as endangered with P. papyracanthus and P. paradinei as threatened, in regard to the Smithsonia Report, mapping of ranges of listes species is only just beginning and the full range of the above species is only known to be quite limited. Therefore, we suggest that an emergency situation exists in regard to the three taxa of Pediocactus and that their range be precisely mapped before final approval of the proposed Kaiparowits transmission line route.

Response: It has been impossible to map the proposed transmission routes in relation to endangered or threatened plant species prior to completion of the EIS. Chapter IV, Mitigating Measures, requires that the proposed transmission line routes be mapped by the participants prior to beginning construction. This would include those species of Pediocactus mentioned above.

(2) Comment: We also urge that the compilers of the Kaiparowits Draft be exhorted to conduct a vegetation survey of the proposed Kaiparowits power plant site and all proposed transmission line routes and their alternates. We would like to see the vegetation study conducted on the same level as the wildlife study; i.e., giving special attention to species thought to be threatened or endangered, and detailing their distribution on maps.

Response: See previous response.

(3) Comment: The inadequacies of the vegetation surveys can be seen in the following excerpts from the Draft: vol. II, p. 167: Along remainder of

proposed route between Las Vegas and El Dorado Substation, a typical creosote-burrobush association prevails. Thornbush, gray krameria, Mormon tea and many species of cactus are common to this association. Taxa should be listed by their latin binomials as common names could refer to any number of closely related species. Only then can such taxa be checked with the Smithsonian Report in order to determine their status. Also the cacti need to be identified down to genus, species, and variety in order to properly evaluate their status.

Response: The common names used are shown in the reference material binding with their corresponding scientific names. Endangered and threatened species are listed by scientific names both in the body of the statement and in the reference material.

(4) Comment: Vol. II, p. 173, section entitled "Rare and Endangered Species": to summarize, this page lists only the plants protected by Arizona state law and is not specific as to whether or not these protected species occur on the proposed transmission line route. The list does not acknowledge to the existence of the Smithsonian Report and the many threatened and endangered species which may be located within the boundaries of the Kaiparowits project. The Report should be consulted and its recommendations followed.

Response: Part of the Smithsonian Report has been included in the Final EIS by placing those species located in the four states crossed by the proposed transmission line into the reference material. Without detailed vegetative surveys, it is impossible to state which of those species would be found along the proposed transmission line routes.

(5) Comment: Vol. II, p. 174: An intensive vegetative study of the total route has not been made. Because of the critical situation which may exist with certain cacti, it is imperative that an intensive vegetative study

be made and that it be published with distribution maps in the environmental impact statement. There are other endangered and threatened Cactaceae indigenous to the affected areas outlined in the Draft; e.g., Pediocactus sileri, an endangered species growing within Pipe Springs National Monument and Kaibab Indian Reservation; Pediocactus bradyi, P. peeblesianus var. fickeiseniae, both growing in close proximity to the proposed transmission lines. One species, Echinocactus xeranthemoides, which grows in southern Utah and is not listed in the Report, should be mapped. The following Sclerocactus species are listed in the Report as threatened and their distribution should be noted: S. wrightiae from Utah; S. spinosior, native to Utah and Arizona; and S. pubispinus, from Nevada and Utah. Sclerocactus glaucus is an endangered species, but it may occur only farther east from the Kaiparowits routes.

Response: We agree that a vegetative study is necessary to map the distribution of the endangered and threatened plant species. Echinocactus xeranthemoides has been added to the endangered and threatened plant list, even though it is not known on what list it has been identified as endangered or threatened. The answer to mapping is the same as that for Comment No. 1.

(6) Comment: Vol. II, p. 175, fig. 35: presents a list compiled by the California Native Plant Society of endangered and rare species "...which occur within the vicinity of the proposed powerline system." (II, 174). How the powerlines will affect such taxa as Coryphantha vivipara var. alversonii and Dudleya saxosa var. aloides, is not discussed, nor are any distribution maps presented. Fieldwork is needed here.

Response: The degree to which the proposed transmission line will impact these species is unknown since an intensive survey has not been conducted. Also, exact location of proposed transmission lines and tower sites has not been identified.

(7) Comment: Vol. III, P. 139: "Unique vegetation on the Kaiparowits Plateau (very old pinyon and juniper trees)...The impact from loss of this unique vegetation could be great." There is no mention of cacti growing in this area, which could well contain species of Echinocereus, and Pediocactus simpsonii var. minor. A complete report of the Kaiparowits Plateau vegetation should be submitted and published in the impact statement.

Response: A report of the Kaiparowits Plateau vegetation is presented under Kaiparowits Plateau impact area, Chapter III, p-135, of the Draft Statement.

(8) Comment: Vol. III, pp. 147-148: "The following protected plants either occur or are likely to occur along the proposed route in Arizona: Washingtonia filifera (fan palm), Lysiloma thornberi (ornamental tree), Bursera fagaroides (elephant tree), Cereus schottii (senita or "old one"), Cereus thurberi (organ pipe cactus), Toumeya papyracantha (toumeya), Toumeya peeblesiana (toumeya), Neoevansia diguetii (dahlia cactus), Pediocactus paradigmii (pediocactus)." Since these are important plants, it is crucial that their ranges be mapped to find if they truly do occur along the proposed powerline routes. If a significant portion of their range is to be disturbed by the Kaiparowits project, then alternate proposals for location of powerlines, access roads, haulage roads, and facility sites should be submitted.

Response: As stated previously, a detailed vegetative study has not been completed to map endangered and threatened plant species. However, this study will be accomplished prior to construction. This will enable relocation of access roads, towers, etc., to reduce the impacts to endangered or threatened plant species.

65. Rocky Mountain Federation of Mineralogical Societies

No response required.

66. U.S. Dept. of the Interior, Bureau of Reclamation

(1) Comment: Chapter I, Description of Proposed Action: We believe the section on the need for the power and energy could be improved. The historic relationship of electric power and energy consumption to economic stability, employment, and gross national product should be briefly discussed. The importance to the Nation of utilizing internal coal resources, as opposed to foreign oil, should be discussed.

Response: See response to Rudolph's Comment No. 6, Hearing section. Also, see Chapters VI and VIII.

(2) Comment: As a supplement to the narrative description in the draft statement, it would be helpful if the proposed routes shown on Illustration 38, which is a key map of the transmission system, were identified by voltage class, title, number of lines, and ownership. A legend would be helpful in showing some of that information.

Response: New revised maps have been included in the Final EIS.

(3) Comment: Page I-183: The proposed Kaiparowits-Navajo route is not clear on that map.

Response: See previous comment.

(4) Comment: Page I-230: Under the heading, Towers conductors and footings," there should be a discussion on the type of conductors which will be used in the line, particularly with regard to whether the conductors will be a nonspecular type or not.

Response: The participants have not decided which type of conductor would be used.

(5) Comment: Page I-345: Fourteen projects are listed which may or may not have a cumulative impact on air quality. It is stated that "cumulative

impacts, if any, will be specifically set out in subsequent parts of the statement." Cumulative impacts on air quality are not mentioned in the summary sheet, nor did we find any significant coverage in the remainder of the statement.

Response: The potential plume interaction between the Navajo plant and the proposed Kaiparowits power plant is discussed in Chapter VI of the Final Statement. Also, see responses to Rudolph's Comment No. 7 and Janke's Comment No. 2 presented in the Hearings comment section.

(6) Comment: Page I-353, third paragraph, fourth sentence: Diversion points for the Sanpete Project are in the drainage of Cottonwood Creek, a tributary of the San Rafael River, not in the Price River drainage.

Response: Concur. The text has been revised.

(7) Comment: Page I-355, third line: The report states that the Uintah Unit of the Central Utah Project has been given "conditional" authorization. That may have been true when the report was written; however, the "conditional" term should be removed since the Uintah Unit is now in an authorized status.

Response: Concur. The text has been revised.

(8) Comment: Page I-356, second paragraph: Delete the last sentence and substitute "The Uintah Unit was authorized by the Congress pending certification by the Secretary of the Interior. The Secretary of the Interior signed the Certification Report on August 21, 1975, for submission to the President and the Congress."

Response: Concur. The text has been revised.

(9) Comment: Chapter III, Environmental Impacts of Proposed Action: There is no discussion or analysis on the emergency control of accidental oil spills at the powerplants or switchyards. Section 301 of Public Law 92-500 requires the preparation of a spill prevention control and countermeasure plan for prevention and control of oil spills.

Response: Concur. The potential for contamination of water by accidental oil spills was addressed in the Water Resources section of Chapter III. Stipulations by BLM and included in the water service contract (to mitigate possible contamination of water including that from oil spills) are addressed in Chapter IV. Also, in Chapter I, the participants have committed themselves to retention dikes around the fuel storage tanks which would facilitate cleanup.

(10) Comment: There is no discussion or analysis on the relationship between the Safe Drinking Water Act of 1974, the regulations for drinking water standards, and the quality of the water pumped as a supply for the new town. Does the 750 milligrams per liter (total dissolved solids) meet drinking water standards? Do individual mineral constituents exceed standards?

Response: The dissolved solids concentration of ground water pumped for the proposed new town may exceed the maximum allowable limits recommended by the Public Health Service. The water supply for the proposed new town would have to meet the requirements of the Utah Division of Health. (See water resources section of Chapter II for discussion of drinking water standards.)

(11) Comment: Chapter IV, Mitigating Measures, pages IV-87 and -88: The transmission line construction will necessitate removal of plants protected under the Arizona Native Plant Act (Arizona Revised Statutes, Section 3-901, et sequentes, 1972). The protected plants can be removed for transplanting through cooperation with the Arizona Agricultural and Horticultural Commission. The Commission should be contacted and a mitigation program for protected plants undertaken by transplanting. A similar arrangement could be made with the State of California.

Response: Concur. The text has been revised.

(12) Comment: Chapter VIII, Alternatives to the Proposed Action, page VIII-200, figure 8: The figure gives the height of the 600-kV d.c. towers as 140

feet. We understand that the height would be about 165 feet. Figure 8 gives the height of the 765-kV a.c. towers as 140 feet. We understand that the height would be about 162 feet. Figure 8 indicates the 600-kV d.c. line routing to be from Kaiparowits to Serrano via the Moenkopi and Devers. We understand this d.c. line routing, as now planned, would be from Kaiparowits to Mesa (near Rosemead) via Eldorado.

Response: Concur. The text has been revised.

(13) Comment: Pages VIII-200 and -201 - (Single-Circuit 600 kV d.c.): As implied in the comment immediately above, the d.c. line routing should be changed. Also, the report should include discussions of the costs and reliability of the single-line d.c. system as compared to the two-line 500 kV a.c. system. It is understood that the investment cost of the single-line d.c. is less, the present worth of the future yearly costs including cost of losses is more, and the reliability is less than the two-line 500 kV a.c.

Response: Concur. The text has been revised.

(14) Comment: Page VIII-201 -(Single-Circuit 765 kV a.c.): The comment is similar to the comment above on the single-circuit 600 -kV d.c. system. The costs and reliability considerations, as compared to the two-line 500-kV a.c. system, should be included for the single-circuit 765-kV a.c. system. We understand that the costs of the latter system are less and the reliability is less; the decrease in reliability is such as to make the system unacceptable.

Response: Concur. The text has been revised.

(15) Comment: Page VIII-201 - (Double Circuit 600 kV d.c and Double-Circuit 765 kV a.c.): The report should indicate that although the reliability of such systems would be adequate, the costs would be prohibitive.

Response: The Impact Statement does not present economic comparisons or cost values unless they pertain to impacts or the consumer. The costs of various alternative systems to the participants are not discussed.

(16) Comment: Page VIII-375: The last paragraph on that page concerns a discussion of 'Alternative uses of water and coal.' The discussion and Figure 23 on page VIII-376 are limited to the Lake Powell Area. We feel that action should be broadened to include the entire Colorado River Basin in Utah, particularly with respect to water uses and water rights. In December, 1974, the Utah State Engineer published 'An Inventory of Water Rights, Upper Colorado River Basin, Utah,' which includes many more applications for energy-related projects than are listed in Figure 23. All of that water use will fall within Utah's allotment of Colorado River water.

Response: It has been the Department of the Interior's position that the initial Southwest Energy Study provided an overview of regional energy developments and was concluded to be adequate at that time. In consequence, the Kaiparowits environmental study has been site specific and covers only the Kaiparowits proposal along with existing energy sources. This section has been expanded in the Final EIS.

(17) Comment: Reference Material, page A-136: It is stated 'If the availability of water in the Southwest is the limiting factor in the production of energy resources, a net energy gain could be realized if Kaiparowits water from the Colorado River were shifted to use in oil shale production.' Since water supply may be a limiting factor in future developments, we suggest the statement regarding alternative use of water be discussed at greater length in the alternatives section of the environmental statement.

Response: The section on alternative use of water has been expanded in the Final EIS.

(18) Comment: Pages A-545 and -553 and Corresponding Reptile Narrative, in Chapter II: The narrative in chapter II and tables on pages A-545 and -553 appear to represent a less than adequate analysis of the reptile and amphibian fauna native to the subject areas. Subspecies, unique in the world and found in that area, are not adequately described. The impacts to those unique animals are not adequately addressed.

Response: The data appearing in Chapter II and potential impacts discussed in Chapter III are based on present knowledge of the subspecies. Further information is not available at this time.

67. State of Nevada

No response required. Since this letter included comments on an internal working draft, it was not reviewed for revision purposes or printed. However, a second letter on the DES was received and responded to later in this chapter.

68. County of San Bernardino

(1) Comment: That the final EIS reflect the findings of the Joint Utilities Management Plan which will be forwarded to the Bureau of Land Management upon completion in early 1976:

Response: The Joint Utilities Management Plan was never received for our review and analysis, Therefore, its findings were not included in the Final EIS.

(2) Comment: That serious consideration be given to energy conservation and alternative methods and sources of power generation before proceeding with the proposed Kaiparowits Project.

Response: These items have been addressed in Chapter VIII in both the draft and Final statement.

(3) Comment: That a potentially more environmentally acceptable regional direct current transmission system should be given careful consideration as an alternative for the proposed 500 kV ac system.

Response: The use of direct current transmission system is discussed in the Alternatives section, Chapter VIII. The consideration to use an alternate dc system will be up to the decision makers after the Final EIS is made available to the public.

(4) Comment: Since the need for the Kaiparowits Project has been based upon the projection of historic electrical demand growth rates of 6% or greater, the need for such a facility should be carefully reassessed. Current projections indicate that these growth rates may well be unrealistic for the future.

Response: The Final EIS contains an independent demand forecast which indicates that the growth rate would probably be lower than that forecast by the participants.

69. U.S. Dept. of the Interior, Fish and Wildlife Services

(1) Comment: Discussions of long-term adverse impacts on fishes, wildlife, and the environment are scattered throughout the sections and often appear conservative and contain too little consideration of cumulative effects. Chapter III-8, Paragraph 6, estimates that salt accumulation on 1,375 acres would result in an estimated loss of 20 deer. One hundred and forty-four pages later, Chapter III-152, Paragraph 1, we find the powerplant would permanently occupy 930 acres, resulting in a loss of an additional 30 deer. In another section, we find that the new town will wipe out the only antelope herd in the

area. Another section contains the possibility that mercury emissions will severely impact the already mercury-contaminated sport fishery in Lake Powell.

Response: Concur. Text has been revised.

(2) General Air Quality Comments: Chapter I-6, Paragraph 1: Emission controls on the stack will be designed to remove 99.5 percent of the particulate matter and 90 percent of the SO₂ (sulphur dioxide). At peak efficiency, an estimated 12.2 tons of fly ash, 34.3 tons of SO₂ and 250 tons of NO_x (nitrogen oxide) would pass through the removal systems each day into the atmosphere. Experience shows that over a long-term period a well-designed and well-maintained system will average less than 99.5 percent or 97 percent of its rated efficiency. If this is accurate, we would expect the average emission of particulates to increase to 73.2 tons per day with corresponding increases in emissions of sulphur dioxide. In addition, Chapter II-37, Figure 2, lists trace elements that are expected to be in the stack emissions. The list includes mercury, arsenic, lead, cadmium, beryllium, fluorine, selenium, and some radioactive nuclides, all of which are toxic to living organisms including man. Most of these are fairly stable and tend to accumulate in the environment. The accumulative effects of the materials in this semi-arid climate need to be evaluated. The movement of these materials through the various biological systems should be defined, especially where trace materials are concentrated by living organisms.

Response: Concur. Trace elements in the stack emissions are toxic to living organisms including man. They are fairly stable, and they can move through biological systems accumulating in harmful concentrations in predator species. Standiford, Potter, and Kidd (1973) discuss the existing and potential future problems with mercury in the Lake Powell ecosystem. Their findings, especially as they relate to large game fish, were discussed in the Draft EIS.

The potential impact of mercury emissions upon the Lake Powell ecosystem was also discussed. Comparatively little is known about many other toxic trace elements. Investigative work tends to initially focus on the problems of analysis and survey in an attempt to define the scope of a pollution problem. Complex toxicological and ecological studies such as determining toxicity thresholds (which vary under different conditions), sub-lethal effects, accumulative effects, and movement through ecosystems are usually, by necessity, delayed until the completion of preliminary work. Existing studies have been mainly in the heavily polluted Eastern and Great Lakes states which have considerably different climate, water chemistry, soils, and biota than exist on the cold desert. This makes application of even these studies tenuous. We concur that studies are needed to answer your questions, however they are beyond the scope of this EIS. Hopefully this process of environmental impact assessment will focus sufficient attention on these problems to stimulate the necessary research by qualified governmental agencies or university groups.

(3) Comment: Chapter III-78, Paragraph 4: The assumption that most trace elements would be deposited uniformly in a 30-mile radius of the stacks is not warranted. Prevailing winds are northeasterly (Chapter II-47, Paragraph 1). Some emission elements would drop out of the air column sooner than others, resulting in heavier concentration in the vicinity of the plant and in a northeasterly direction from the plant. Sulphates and nitrogen oxides can be carried great distances under the right conditions.

Response: We recognize the deposition would not be uniform but the state of the art is such that precise estimates of deposition trace elements, based on distance and wind direction, cannot be accurately determined.

(4) Comment: Chapter III-3, Paragraph 2: Reduction in visibility from plume opacity is estimated at a maximum of 11 percent. This assumes that the

emission control equipment will function at maximum rate efficiency. This should probably be figured at a long-term efficiency average. Airborne dust from mines, quarries, and unsurfaced roads should be added to the estimate. Also, there are other existing and proposed plants in the vicinity that will have an accumulative detrimental effect on the air quality and visibility of the area. This is particularly noteworthy when one considers that there are several National parks, monuments, and recreation areas within a 100-mile radius of the Kaiparowits Plant.

Response: Additional discussion of plume opacity as related to emission control being obtained at other power plants has been added to the Final Statement as well as additional discussion of potential additive effects of Navajo and Kaiparowits.

(5) Comment: Chapter V-28, Paragraph 3: An estimated 1,812 tons of salt will be deposited each year of operation over an estimated 1,375 of land. Since this is a semi-arid area, one would expect salt to accumulate over the lifetime of the project. This, coupled with fly ash and dust deposits, toxic tract elements, and the acidifying aspects of stack emissions, will likely have chronic effects which may in the long run denude a large area of land of native plant species and seriously impair the productivity and plant diversity of thousands more acres downwind of the stacks. Nearby streams, seeps, springs, and groundwater supplies will also be polluted. The degree of pollution is not well defined in the statement nor the impact of this pollution.

Response: The potential impacts of salt drift, stack emissions and various wastes generated by the proposed project on water quality are discussed in Chapter III of the Draft EIS; the summaries of Chapters III and V of the Final EIS have been expanded and address these potential impacts.

(6) Comment: The location of the project in an area where water is a prime concern could pose a threat to fish and wildlife dependent on this valuable resource for survival. Lake Powell is a possible source of conflict between fish and wildlife dependence and water use by power plants. Possible means of resolution of this conflict should be addressed in the final statement in the form of a comprehensive plan for fish, wildlife, recreation, irrigation, utility needs, etc., on Lake Powell.

Response: The purpose of an impact statement is to present an analysis of impacts, not develop plans. However, an understanding of impacts may trigger the development of a plan.

(7) Comment: There are some striped bass nursery ponds (not mentioned in the EIS) at the lower end of Wahweap Creek that may be affected by contamination from the new town or powerplant sites. These potential impacts are not discussed in sufficient detail to permit the reader to evaluate the level of expected impact.

Response The State operated striped bass rearing ponds have a water supply relatively independent of surface runoff and are not particularly vulnerable to contamination from upstream sources.

(8) Comment: Chapter II-47, Paragraph 1: Long-term wind data show that net air movement over the powerplant site is east and northeasterly. Nitrogen oxides, sulphates, and toxic materials will eventually be carried and deposited over long distances by prevailing winds. In a recent study, two Canadian lakes were slowly acidified and their fish populations eradicated from airborne sulphate emissions from an industrial plant over 100 miles away.

Response: Considerable analysis and study was given to the potential impacts of acidification with the conclusion that in the arid Kaiparowits Plateau area with soils and waters of high pH, the impact of acid fallout

experienced in the East would not be likely on the plateau. The discussion of this potential problem, in Chapter III, was expanded as a possible long term impact in the FES.

(9) Comment: There are possibly some distinctive races and species located in this rather limited and fragile habitat area. Some of these smaller lakes and tributaries in the fallout zone may also be seriously impacted. The potential of these impacts should be discussed in detail sufficient to give the reader a feel for severity of impact.

Response: Discussion on possible long-term, cumulative effects from fallout of toxic materials in the Kaiparowits area was expanded in Chapter III of the Final EIS. Impacts on distinctive races or species of fish were not mentioned as it is not certain that any such fish in fact occur within the impacted area.

(10) Comment: Chapter III-154, Paragraph 1: Some game fishes already approach the upper limits of mercury content (500 ppb) for human consumption set by the Food and Drug Administration. Mercury levels will be increased in the Lake Powell sport fishery comprising 11 game fish and several nongame fish species. Increased mercury is listed as a potentially serious impact, but what will this mean in terms of public health and lost fishing days?

Response: The impact in terms of lost man-days of fishing was mentioned in the next paragraph in the Draft EIS. The discussion of mercury was expanded in the Final EIS. As one recent publication reveals (Mercury and the Environment, 1974), the presence of mercury, and especially its accumulative impact, in water used for consumption, or in fish used for consumption, is a serious danger. Even though ubiquitous, the ingestion of too much mercury may cause serious brain and/or nerve damage; visual damage; ataxia; and may produce genetic aberrations. "In all, several hundreds if not several thousands of

deaths have been involved." (ibid, P-132) Obviously then, if an "epidemic" were to develop, fishing in the immediate region of Kaiparowits would be curtailed, if not completely abolished.

(11) Comment: Chapter III-153, Paragraph 3: The effects of toxic trace elements on the terrestrial habitat and wildlife are not discussed in detail. This item, especially accumulated effects, should be included. Some trace materials would likely be taken up by plants, and others, like mercury, would be ingested directly from vegetation surfaces by wildlife species.

Response: Discussion of cumulative effects of trace elements on terrestrial habitat has been expanded in Chapter III of the Final EIS.

(12) Comment: The reservoir dynamics of Lake Powell, and fish distributions, are not described in sufficient detail. The reservoir water level fluctuates and will be at the 3550-foot level or lower 10 percent of the time (Chapter III-153, Paragraph 1). At times, it will reach the 3490-foot level. The water intake pipe is located at the 3480-foot level and will be extremely difficult to screen (Illustration 18, Chapter I). The thermocline is at a depth of 90 to 100 feet by August, and the salmonid fishes range in depth to, or below, the thermocline. While placing the water-intake pipe deep in the reservoir, there will no doubt be fish losses through the intake system. We lack data to assess these losses.

Response: Sufficient data was unavailable to properly assess losses of fish at the water intake. The Draft Statement attempted to discuss the potential loss in perspective by pointing out that the intake is a single point in a reservoir about 150 miles long. Unless unforeseen circumstances cause an exceptional concentration of fish at the intake, losses should not appreciably affect fish populations of the reservoir.

(13) Comment: Chapter I-306-312 details employment projections in the Kane-Garfield, Utah Counties and Page, Arizona, area and plans for the development of the new town associated with the Kaiparowits project. The project will bring in an estimated 14,000 to 15,000 new residents, roughly tripling the population of the area. Plans should also be included to mitigate the socio-economic impact on these people and the States of Utah and Arizona when powerplant operations cease in the not-too-distant future (35 to 40 years), and they are surrounded by a degraded environment.

Response: City and county government is obliged to assist displaced employees if the plant ceases to operate. It is not within the scope of this statement to provide for such measures in Chapter IV. Concerning site abandonment issues, see response to Letter No. 52, Comment No. 1.

(14) Comment: Alignment of the proposed Kaiparowits-Phoenix transmission line is a specific example of this general problem. The proposed transmission line route would pass through good wildlife habitat from the northern boundary of the Kaibab National Forest ten miles northwest of Williams south to New River, a distance of about 100 miles along the alignment.

Several likely alternatives exist to the west of the mountains and mesas of the proposed alignment. We know that during the early stages of drafting the EIS, Bureau of Land Management was working with alternative routes further west in Chino Valley. We believe these routes should be discussed in the EIS. One alternative not considered for the Kaiparowits-Phoenix route in the early stages paralleled the proposed Kaiparowits-Moenkopi-Mohave transmission line route west as far as Chino Valley and then turned south through Chino Valley. Another alternative not considered is to follow the existing route to Highway 66 and then follow the highway east to Chino Valley and turn south through the valley. South of Chino Valley, by far the least destructive alternative route

for wildlife would parallel immediately adjacent to the west side of Interstate 17 from Cordes Junction south to New River. This alternative should also be discussed in the EIS. The existing twin 500 kV Navajo Transmission lines parallel 2000 feet from the proposed Kaiparowits-Phoenix route, and they have had excessive adverse impacts on mule deer and antelope herds on Sycamore, Perry's, and Black Mesas and cross critical antelope, deer, and elk wintering range north and south of Highway 66 near Williams. Another 500 KV powerline 2000 feet away from the existing 500 KV powerlines, as proposed, would only add to the burden on wildlife. The 2000-foot separation would require building as much new access road as was required for building the Navajo Lines. Our biological assessment, more in hindsight than original good planning of transmission line corridors, indicates that alignment of the Navajo Lines was a mistake, and we would not like to see the existing Navajo Lines right-of-way expanded.

Response: The impacts of the proposed transmission line route in Chapter III have been revised.

Chapter VIII, Alternatives, considers two alternates that would allow use of the Navajo corridor but result in fewer impacts than the proposal: 1) the Line Spacing Alternate would require that new lines be separated a minimal distance from the Navajo lines and 2) use of existing systems would either require upgrading the Navajo lines to higher voltage levels or utilize currently unused capacity.

(15) Comment: Chapter III, Paragraphs 3-5: About 1,600,000 cubic yards of aggregate material will be needed for construction purposes. About 200,000 cubic yards will come from Upper Wahweap Creek. The rest will be taken apparently opportunistically from undesignated sites. This has the potential to severely damage many undesignated streams along the roads and transmission line routes. All aggregate sites should be identified and controlled. No aggregate should be

taken from Paria or any perennial streams unless absolutely necessary the impacts should be identified in the statement.

Response: Selection of the remaining aggregate sources would be made after approval of the project. These sites would be analyzed for impacts on an individual basis. Site-specific stipulations to prevent adverse impacts would be completed by the authorized officer.

(16) Comment: Chapter I-59, Paragraph 1: The kind of "non-toxic" chemical dust suppressant suggested as a substitute for water at coal sites should be identified.

Response: The exact "non-toxic" chemical dust suppressant is not known at this time as new suppressants may appear on the market at a future date, which would be better than existing suppressants.

(17) Comment: Chapter I-84, Paragraph 1: One foot of earth cover over the ash and sulphate fill area seems inadequate for revegetation. Certainly no trees or deeply rooted plants will likely grow there again. Since plants in the event they do survive on this harsh site, will contain toxic elements from the waste materials, the area should probably be fenced to prevent browsing by native and domestic animals.

Response: One foot of earth cover has been proposed by the participants. BLM recognizes that this is not adequate for protection or revegetation purposes. Chapters III and IV of the Statement discuss this problem. The participants have not proposed to fence any of the plant site.

(18) Comment: Chapter I-115, Paragraphs 1-2: Water-monitoring plans should be detailed as to what will be monitored and at which sites.

Response: A water monitoring program has been developed and is discussed in the Final EIS.

(19) Comment: Chapter I-240, Paragraph 4: This paragraph says that new access roads would be constructed along the transmission line right-of-way when suitable existing roads were not available. It would help if maps were provided showing where new access roads will be built. We cannot assess the impacts of at least several hundred miles of new access roads without knowing where they will be.

Response: The exact alignment of the transmission lines have not been identified, therefore, the actual road locations are also unknown. The statement has been prepared through an analysis of the impacts to transmission corridors since site locations on transmission lines, towers, access roads, etc. are unknown at this time.

(20) Chapter I-243, Paragraph 2; Chapter I-299, Paragraph 4; and Chapter I-301, Paragraph 3: These paragraphs combined indicate that access roads for the southern transmission system in Arizona will be closed and obliterated after construction, and patrolling for maintenance purposes would be by air. However, access roads for the western transmission system will be bladed annually and maintenance patrolling of the powerlines will be by ground vehicle on these roads. We question why it is feasible for the southern system applicants, Arizona Public Service and Salt River Project, to obliterate access roads and patrol by air, which would permit reestablishment of wildlife habitat, while these measures are not feasible for the western system applicants, Southern California Edison and San Diego Gas and Electric Company.

Response: Chapter I is a description of the participants proposals. Mitigating measures as described in Chapter IV are applicable equally to the three participating companies no matter what action the participants may propose as to corridor access, maintenance, reseeding, etc.

(21) Comment: Chapter I-337, Paragraph 3: Construction of the new highway to plant, town, and mines will require 39 stream crossings. These plans should be reviewed to keep the number of stream crossings to a minimum. Any culverts used must be properly aligned, laid at streambed levels, and large enough to accommodate flood conditions. Disturbance of stream-channel alignment and banks must also be minimized and the stream banks subsequently stabilized.

Response: The use of the word "streams" is a misnomer. The crossings are actually dry washes which carry water only during rainy periods.

(22) Comment: Chapter II-4, Paragraphs 3-5: Contains a list of endangered species in the impact areas. The following fishes should be added to the list: (1) humpback chub, (2) bonytail, (3) Colorado cutthroat trout, and possibly other, as yet unidentified, species. The presence of terrestrial wildlife species should be closely reexamined as well.

Response: The humpback chub, bonytail and Colorado cutthroat have been added to the list of endangered fish in the summary section of Chapter II of the Final Statement.

(23) Comment: Chapter II-190, Paragraph 1: The only free-roaming herd of bison outside of a national park are located in the Henry Mountains in the secondary impact area. This isolated population will perhaps receive fallout of acidic and toxic materials, and will be further impacted by increased access roads and human populations.

Response: Impacts of increased access and human activity on the Henry Mountain bison herd were mentioned in Chapter III, page 157 and 158 of the draft. Discussion of potential long-term cumulative impacts of toxic fallout has been expanded in the Final EIS.

(24) Comment: Chapter II-194, Paragraph 2: This paragraph indicates that Flat and Wild Steer Mesas are crucial mule deer winter range. The pinyon-juniper

habitat in the general area of the mesas is also crucial winter range. Reference merely to the mesas is too restrictive to define this crucial winter range.

Response: Concur. The text has been revised.

(25) Comment: Chapter II-195, Illustration 22: This illustration depicts wildlife-crucial game species habitat. It should also indicate for what purpose the areas are critical or the narrative on adjacent appropriate pages should specifically reference the various circled critical areas. The area circled for mule deer immediately south of Highway 66 should also be indicated for white-tailed deer, since it is also winter range for this species. The Coconino Plateau should be circled as important winter range for elk, mule deer and antelope which move northwest off mountains to the east of Highway 64, such as Sitgraves Mountain, Kendrick Peak, and San Francisco Mountains, onto the plateau in the area west of Highway 64 and north of Highway 66.

Response: Concur. The text has been revised.

(26) Comment: Chapter II-199, Illustration 24: This illustration shows endangered, threatened, protected or unique crucial wildlife areas. It should be shown that it is crucial raptor nesting habitat where the proposed Kaiparowits-Phoenix route crosses the Verde River. A survey this year by our Service indicated several raptor nests in this area of which one was of a size and structure indicating it might belong to an endangered Southern bald eagle.

Response: Concur. The text has been revised.

(27) Comment: Artist's Insert between II-199 and II-200: The artist's illustration shows five game species and the caption states, "The proposed transmission system would impact habitat for several animal species." This illustration is misleading since the work "several" combined with the illustration of five game animals indicates these are the animals that will be affected,

which is not the case. This page, although artistic, serves no useful purpose and we believe it should be eliminated.

Response: Concur. The text has been revised.

(28) Chapter II-200, Paragraph 6: This paragraph discusses elk habitat along the proposed powerline routes in Arizona and should indicate the proposed Kaiparowits-Phoenix route passes through crucial winter range of elk north and south of Highway 66. It would help to reference Illustration 22 for this discussion.

Response: Concur. The text has been revised.

(29) Comment: Chapter II-201: The power transmission system will bisect ranges and migration routes of many wildlife species. The effects of high-voltage electrical fields on use of and migration patterns through these areas are not well known. There appears to be some reason to believe that domestic pigs at least can detect electrical fields. The desert bighorn sheep and some rare animal species within these corridors are of particular concern. The added access roads into these areas are also of concern.

Response: Concur. The text has been revised.

(30) Comment: Chapters II-201 and II-202: These pages discuss antelope habitat along the proposed powerline routes. That area along the proposed Kaiparowits-Moenkopi-Mohave route from Page, Arizona, to the Peacock Mountains, about 20 miles northeast of Kingman, Arizona, should be included in this discussion.

Response: Concur. The text has been revised.

(31) Comment: Paragraph two on II-202 reads "Coconino Plateau near Williams is important winter range for antelope..." This should be changed to read "Coconino Plateau and the areas circled on Illustration 22 north and south of Highway 66 near Williams are important winter range for antelope..."

Response: Concur. The text has been revised.

(32) Comment: Paragraph three on II-202 reads "Sycamore Mesa north of Phoenix supports a small population of antelope. This area is crucial to the survival of this herd." This should be changed to read "Sycamore, Perry's, and Black Mesas north of Phoenix support small populations of antelope. These areas are crucial to the survival of these populations."

Response: Concur. The text has been revised.

(33) Comment: Chapter II-202, Paragraph 6: This paragraph discusses peccary habitat along the proposed powerline routes. It should be indicated that peccary have been introduced near the Kaiparowits-Moenkopi-Mohave line in the area of Cottonwood Wash west of Cottonwood Cliffs.

Response: Concur. The text has been revised.

(34) Comment: Chapter II-202 and II-203: These pages discuss mountain lion habitat along the proposed powerline routes and should include that area along the proposed Kaiparowits-Moenkopi-Mohave route where it passes through the Aubrey Cliffs area, since this is good habitat of their primary prey the mule deer.

Response: Concur. The text has been revised.

(35) Comment: Chapter II-207, Paragraph 2: This paragraph covers habitat of the golden eagle and the northern and southern subspecies of the bald eagle in areas along proposed transmission line routes. It should be stated that the northern bald eagle winters along the Verde River where the proposed Kaiparowits-Phoenix transmission line route crosses the river and that one of the raptor nests in this area may be that of an endangered Southern bald eagle.

Response: Concur. The text has been revised.

(36) Comment: Chapter II-208, Paragraph 2: This paragraph states that large numbers of birds are seldom seen at any one time or place, except in

Overton Wildlife Management Area. It should be indicated that another exception is where the proposed Kaiparowits-Phoenix transmission route crosses the Verde River.

Response: Concur. The text has been revised.

(37) Comment: Chapter II-215, Paragraph 5: This paragraph also discusses the habitat of the endangered Southern bald eagle; therefore, see our comment for Chapter II-207, Paragraph 2.

Response: Concur. The text has been revised.

(38) Comment: Chapter II-216: Virtually all species of life encountered along the transmission line route are directly or indirectly dependent upon the water supply. Some plants and smaller organisms are dependent upon particular water holes and spings. Water, gravel, and sand removed from areas along the transmission route should be strictly controlled.

Response: Concur. The text has been revised.

(39) Comment: Chapter II-220, Figure 43: This figure indicates the Virgin River is crossed by the proposed transmission line route in Nevada. Maps on I-194 and I-195 show that the Virgin River is not crossed in Nevada. The map on I-193 is difficult to read, but it appears the Virgin River is either crossed in Arizona or Utah, or both. This discrepancy should be clarified and a more legible map showing the relationship of the Virgin River to the proposed transmission line route in Utah and Arizona provided.

Response: New, revised maps have been placed in the Final EIS. The Virgin River is crossed by the transmission line in Nevada.

(40) Comment: Chapter II-224, Paragraph 1: The last sentence of this paragraph states "The Gila topminnow discussed in the threatened species section has expanded its range upstream to the area of these crossings ("these" refers to

the proposed Kaiparowits-Phoenix transmission line route)." The words "has expanded" should be preceded by the word "possibly."

Response: Concur. The text has been revised.

(41) Comment: Chapter III-73, Paragraph 1: After reseeding to prevent erosion, the waste-disposal area should be fenced to exclude animal grazing on plants that will probably contain toxic materials.

Response: After title of the land has passed to private ownership, the Bureau of Land Management no longer has control for mitigation measures. Such mitigation would fall under state and county jurisdiction. There is presently no requirement for the participants to apply mitigatory measures on their land at the time of abandonment, unless the county and/or state enacts such a requirement.

(42) Comment: Chapter III-138, Paragraph 5: This paragraph indicates the amounts of new and temporary access roads that will be required for the primary, northern Kaiparowits, and Arizona Strip transmission line proposals. See our comment for Chapter I-240, Paragraph 4 concerning the primary proposal, since it also applies to the northern Kaiparowits and Arizona Strip proposals.

Response: See our response to previous Comment 19.

(43) Comment: Chapter III-171, Paragraph 4: This paragraph discusses impacts the proposed transmission lines will have on raptors. The last two sentences state "The most crucial area is the Beaver Dam Mountains. This area would be impacted if the line were constructed during the spring raptor nesting season in the area." These two sentences should be changed to read "The most crucial areas are the Beaver Dam Mountains and the Verde River crossing. These areas would be adversely impacted if the lines were constructed during the spring raptor nesting season."

Response: Concur. The text has been revised.

(44) Comment: Chapter III-345, Paragraph 4: This paragraph indicates hunting would benefit from increased access roads proposed along the routes. This contradicts statements made at III-163, Paragraph 2; III-167, Paragraph 2; and III-169, Paragraph 1, which indicate animal populations will be adversely affected by access roads. While hunter access would be improved, hunter success would decline due to reduced animal populations. This has been the case on Perry's Mesa as a result of excessive pressure placed on the mule deer herd because of the Navajo Transmission Lines access road.

Response: Concur. The text has been revised.

(45) Comment: Chapter IV-16, Paragraph 2: Soil permeability and percolation rates would be expected to increase under the increased head pressures of the reservoirs.

Response: With the fine mudstone material used to line the reservoirs, an increase in head pressure could result in a decrease in permeability. Therefore, it is not anticipated that there would be an increase in percolation into substrata.

(46) Comment: Chapter IV-22, Paragraph 1: Provisions should also be made for periodic inspections of pollution controls and emissions control equipment by concerned state agency officials.

Response: The impact statement cannot propose provisions for which there is no existing legal basis. However, representatives of the State of Utah would have authority to inspect emissions control equipment. They may make a special point of doing so, in fact, since the state could specify sulfur dioxide emission limits more stringent than EPA standards.

(47) Comment: Chapter IV-24, Paragraph 2: The statement does not describe what action will be taken if the water quality monitoring program shows that

important springs, seeps, or bays in Lake Powell are being significantly impacted by powerplant operations. Perhaps some guidelines should be set up detailing what mitigation, if any, will be required.

Response: As stated in Chapter IV, the water service contract requires compliance with applicable federal and state laws, orders, and regulations concerning water pollution and requires arbitration if acts of non-compliance cannot be resolved by mutual agreement. The contract can be terminated by the United States, upon failure of the participants to perform their obligations. Specific guidelines or stipulations, and a detailed proposal for monitoring water quality would not be defined prior to approval of the proposal.

(48) Comment: Chapter IV-26, Paragraph 3, Items 2-6: All unpaved roads should follow the latest Forest Service guidelines for construction and maintenance of logging roads or other equal standards. This provides periodic rises in downgrades to control runoff water velocity and frequent roadway exit areas for water.

Response: The authorized officer would have the authority to require roads to be constructed in such a manner as to prevent excessive surface disturbance.

(49) Comment: Chapter IV-27, Item 9: A convex shape to the top of the waste area would reduce contact of the water with waste materials and, thus, reduce contamination.

Response: Although a convex shape would reduce the contact of water with waste materials, such a shape would increase the amount of runoff on the 4 to 1 side slopes causing increased erosion rates. This would expose the waste material underneath sooner than anticipated.

(50) Comment: Chapter IV-47, Item 38: In no case should unused concrete be dumped into streams or other bodies of water.

Response: Under Chapter IV, BLM Bonding Requirements, Item 16, all litter and waste from construction activities would be disposed of at locations designated by the authorized officer.

(51) Comment: Chapter IV-48, Item 42: This refers to the applicant's mitigating measure Item 42 and indicates that access roads on the western transmission line system will be maintained in as near their original state as possible. Our combined comment for I-243, paragraph 2; I-299, paragraph 4; and I-301, paragraph 3 is applicable here. Wherever possible, access roads into remote or valuable wildlife areas should be blocked or protected from indiscriminate use.

Response: The participants' item 42 has been deleted in the Final EIS. Other items under the heading of "bonding requirements" cover this impact.

(52) Comment: Chapter IV-49, Item 4b(2): Care should be taken not to remove any more debris from streams than absolutely necessary. Excessive debris removal operations can seriously damage a stream. Some stream cover is necessary in a healthy, productive fish stream.

Response: The measure cited refers to disposal of vegetation that would be cut and uprooted during construction of transmission lines on land administered by the U.S. Forest Service. It indicates that such debris should not be left in stream courses, but it does not require removal of natural vegetation growing along streams. As stated in Chapter IV, the Forest Service would prepare more detailed stipulations upon receipt of finalized, site-specific right-of-way applications, if the proposed project is approved. These stipulations would be intended to minimize all environmental impacts to the maximum extent feasible.

(53) Comment: Chapter IV-55, Item 23d: Add - Prevent release or disposal of oils or other petroleum product in streams or other bodies of water.

Response: This stipulation cannot be changed without Forest Service concurrence. At the present time, concurrence has not been received. This is a Forest Service mitigating measure.

(54) Comment: Chapter IV-65, Item 10: It is unclear from this discussion how far from springs and seeps construction will be allowed.

Response: Item 10, Chapter IV, BLM Bonding Requirements, clearly states that no construction would be permitted within 200 feet of springs and seeps.

(55) Comment: Chapter IV-66, Item 15: Add - Removal or disturbance of vegetation should be kept to a minimum. Often bulldozer operators will "manicure" an area because it looks good only when a small amount of vegetation and soil needs to be disturbed.

Response: Refer to response to previous Comment No. 52.

(56) Comment: Given the implications of Section 7 of the Endangered Species Act, we believe that the mitigating measure described under (1) (a) would have more beneficial results if construction within this two-mile radius of an active, threatened, or endangered raptor nest was limited to helicopter construction since it is primarily the newly created access road that leads to the demise of the raptors due to increased human access to raptor nesting sites.

Response: See item 22(a) 1, BLM Bonding Requirements, Chapter IV. Construction would not be allowed within the two-mile radius under these circumstances.

(57) Comment: Chapter IV-69, Item 23: If it is absolutely necessary that the participants build (1) along the proposed Kaiparowits-Phoenix route in the Kaibab and Prescott National Forests and across Sycamore, Perry's, and Black Mesas south of the Prescott National Forest and (2) 2000 feet away from the

existing twin 500 kV Navajo Project Transmission Lines, then the participants should be required to build by helicopter in the crucial deer, elk, and antelope winter range circled on Illustration 22, Chapter II-195, immediately north and south of Highway 66 near Williams and across the three mesas, which are crucial for antelope kidding and mule deer fawning. Another access road across these mesas could eliminate the antelope herd and greatly reduce the mule deer herd. Both populations were seriously impacted by the twin 500 kV Navajo Project Transmission Lines access road. We understand it is difficult for the applicants to build more than several miles by helicopter without having road access. This road access could be designated in least crucial areas.

Response: The Draft Statement has been changed to require the use of a helicopter to construct the transmission line across Sycamore, Perry and Black Mesas.

(58) Comment: Chapter IV-70, Item 25, Part b: We believe one-fourth mile does not represent much of a physical barrier for protecting the endangered black-footed ferret from man's intrusion. A 1/2-mile boundary would be more satisfactory.

Response: If the species exists along the proposed route, the habitat would be protected by the authorized officer.

(59) Comment: Chapter IV-72, Item 30: Would it be possible, or desirable, to reduce or limit the voltage of lines crossing particularly critical areas?

Response: It is impossible to reduce the voltage in any portion of the transmission line.

(60) Comment: Chapter IV-77, Item 47: We believe the crucial deer, elk, and antelope wintering areas immediately north and south of Highway 66 near Williams and the crucial mule deer fawning and antelope kidding areas on Sycamore, Perry's, and Black Mesas should be included on this list.

Response: Concur. Text has been revised.

(61) Comment: Chapter IV 87, Paragraph 3: There will be about 30 round trips of limestone-hauling trucks per day through a portion of Bryce Canyon National Park. This will affect the scenic beauty, noise level, traffic patterns, and perhaps increase accidents in the park.

Response: Concur. The environmental effect of the limestone haul trucks passing through the northern corner of Bryce Canyon National Park are included in Chapter III of the Final Statement.

(62) Comment: Chapter VIII-70, Kaiparowits to Eldorado (Illustration 16 to 16m): It is extremely difficult to get an overview of the alternatives by flipping back and forth among 16 maps. A single map showing all the alternatives, as was done for the Kaiparowits-Phoenix system (VIII-104), would be helpful.

Response: Due to the size and scale requirements, it was impossible to place these data on a single map.

(63) Comment: Chapter VIII-92, Navajo-McCullough alternate: This alternate is preferable to the proposed route because it follows the existing Navajo-McCullough transmission line and would not disturb crucial Gambel's quail habitat along the proposed route.

Response: This impact was discussed in the Draft Statement and is discussed in the Final EIS under the Navajo-McCullough alternate section.

(64) Comment: Chapter VIII-93, Highway 91 alternate: This is the most preferable route through the Beaver Dam Mountains from a wildlife standpoint. Impacts on raptors, Gambel's quail, and Gila monsters would be much less along this alternate than along the proposed route or other alternatives.

Response: This impact was discussed in the DES and is discussed in the Final EIS under the Highway 91 alternate section.

(65) Comment: Chapter VIII-97, Blake's Lambing Ground alternate:

Cedar Wash has been designated by consultants for the western transmission line system as prime Gila monster habitat in the Beaver Dam Mountains.

Response: This impact was discussed in the DES and is discussed in the Final EIS under the Blake's Lambing Ground alternate section.

(66) Comment: Chapter VIII-100, Railroad Pass alternate: This alternate is preferable to the proposed route from the Eldorado Substation north to where it crosses the proposed route in Railroad Pass since it avoids, except in one small area, a bighorn sheep migration route. However, north of Railroad Pass the proposed route is preferable to the Railroad Pass alternate since the proposed route avoids important winter sheep habitat to the east, which this alternate passes through.

Response: This impact was discussed in the DES and is discussed in the Final EIS under the Railroad Pass alternate and the Black Hills alternate sections.

(67) Comment: Chapter VIII-128, Agua Fria alternate: This alternate is preferable to the proposed route because it avoids critical antelope kidding and mule deer fawning areas on Sycamore, Perry's and Black Mesas, east of Interstate 17, which the proposed route passes through. However, this alternate also passes through good wildlife habitat. We believe the best alternative for this area, to avoid excessive impacts on wildlife, is to construct the powerline adjacent to the west side of Interstate 17 from Cordes Junction south to New River.

Response: The proposal follows an existing corridor that was identified through the Bureau Planning System. Impacts are analyzed in Chapter VIII of the FES.

(68) Comment: Chapter VIII-137, Figure 5: This figure compares impacts between the proposed Kaiparowits-Phoenix transmission line route and the various alternative routes. It shows that the adverse impacts for terrestrial wildlife and terrestrial ecological interrelationships are rated medium for the Agua Fria alternative and slight for the proposed counterpart. This is grossly incorrect and contradicts comments made in other sections of the EIS. As we have indicated earlier in our comments, the mesas crossed by the proposed route are crucial areas for antelope kidding and mule deer fawning. These mesas are incised by many well-vegetated side canyons off the Agua Fria River and are also important habitat for Peccary and Gambel's quail, as well as numerous nongame species of birds, mammals, and reptiles. The proposed route should, therefore, be rated high rather than slight. About 15 miles of these mesas are crossed by the proposed route in this area.

Response: Concur. Figure 5 has been revised. In the FES, this figure is now VIII-11.

(69) Comment: Chapter VIII-136, Kaiparowits to Moenkopi to Mohave (Illustration 18 to 18x): Our comment for Chapter VIII-70, Kaiparowits to Eldorado (Illustration 16 to 16m) is applicable here.

Response: See response to previous Comment No. 62.

(70) Comment: Chapter VIII-210: This table shows that there are only 50 miles of proposed transmission lines for the primary proposal that will be separated by 2000 feet from existing transmission lines. We believe this figure is in error and that the actual value is closer to several hundred miles.

Response: Concur. The figure has been changed from 50 to 468 miles.

(71) Comment: Chapter VIII-350, Alternate Means of Meeting Project Objectives: In reviewing this section we found no mention of whether or not the

twin Navajo 500 kV Navajo Transmission Lines from the Navajo Generating Station near Page, Arizona, to Phoenix are carrying their full capacity. It is possible they are not since only one of the three generating units is presently operating. If they are not at capacity, a short transmission line from the proposed Kaiparowits Generating Station to the Navajo Generating Station would permit full use of these lines thus delaying the need for another 500 kV Line. We believe this alternative should be discussed in the EIS. The draft EIS considers no proposed or alternative transmission line routes from the entry of the proposed route into the Kaibab National Forest northwest of Williams to New River, about 100 miles south, acceptable from a wildlife standpoint. Our general comments and our comment for Chapter II-349, paragraphs 2 and 3, indicate there are alternative routes not discussed in the EIS that would be acceptable to wildlife management. The delay discussed above, if practical, would provide more power to Phoenix and allow additional time to assess alternatives acceptable to wildlife interests. We now know that alignment of the Navajo Transmission Lines in the above-described area was a mistake, biologically, and widening of the existing right-of-way will not be acceptable.

Response: Use of existing capacity from Navajo is discussed as an alternative (Chapter VIII) in the Final EIS. Alternate routes in Chino Valley were not considered because of potential impacts on other resources.

70. The Maricopa Audubon Society

No response required.

71. Real People Press

(1) Comment: But I would like to bring up two much more basic arguments -

1) I did not find in the EIS any study of a conservation alternative, such as

peak-load pricing of power; in the consumer regions -- alternatives which might eliminate the need for the plant.

Response: Refer to Letter No. 44, Comment No. 3, and response to Coles, Comment No. 4, Hearings section. The FES contains alternatives of energy as well as conservation measures which if implemented could reduce the demand.

(2) Comment: Perhaps even more basic is this: 2) The EIS focused only on pollution problems caused by the source: the power plant, transmission lines, mines, etc. Even more important is the additional pollution that will result from increased availability of power to the consumer areas. These areas--Los Angeles, San Diego, etc.--are already some of the most heavily polluted areas in the country. More power will bring more growth, people, cars and all the inevitable pollution that results from large concentrations of people.

Response: Refer to response to Fradkin, Comment No. 5, Hearings section.

72. Colorado Open Space Council

Comment: The Southwest Energy Study, quoted in the draft EIS, predicted that the emissions of one coalfired plant would not have a significant additive effect on the emissions of another such plant if they were more than 60 miles apart but could have additive effects if they were within 16 miles of each other. This leaves the Kaiparowits Project, 36 miles from the existing Navajo power plant, somewhere in limbo. While the EIS concludes that "additive effects with the Kaiparowits and Navajo plants should be reduced under most conditions," the Workshop feels this implies a reduction in air pollution when actually any change would be one toward increasingly polluted air. In addition, the EIS repeatedly states that data are not yet available to assess the effects of the Navajo plant on the regional air quality. Thus it seems we are being asked to accept a possible significant additive effect on top of an unknown increase in air quality degradation.

Response: The potential plume interaction between the Navajo power plant and the proposed Kaiparowits power plant are discussed in Chapter VI of the Final Statement. Also, see responses to Rudolph's Comment No. 7 and Janke's Comment No. 2 presented in the hearings section.

73. National Audubon Society

No response required.

74. Douglas W. Steeples

Comment: The dangers of the project stem chiefly from two types of environmental impact--a threatened deterioration of air quality from the release of three hundred tons daily of air pollutants from four huge smoke stacks, and from mining activity and road traffic in an unstable environment, and from the impact on the landscape and surface of road and transmission line construction and mining itself. The Environmental Impact Statement submitted with the project fails to address these problems directly, on the one hand by ignoring a statement of the Southwest Energy Study which predicted no additive atmospheric effects from emission by plants more than 60 miles apart (the Kaiparowits would be but 36 miles from the existing Navajo Power Plant), and on the other hand by predicting no significant climatic effects where the National Oceanic and Atmospheric Administration (presently conducting studies of the Four Corners region) concluded that "it is reasonable to assume that there is as yet insufficient data to assess the long-term meteorological consequences of coal development" in the area.

Response: The air pollution portion of the Final Statement addresses fugitive dust and exhaust fumes. Also, see responses to Phillips' Comment No. 2, Atwood's Comment No. 1, and Crall's Comment No. 1, presented in the Hearings section. Cumulative impacts are discussed in Chapter VI.

75. Tennessee Valley Authority

No response required.

76. Richard W. Shanteau

Comment: The second and also quite important reason for not allowing the project is of course environmental. Mercury poisoning may well destroy sport fishing in Lake Powell, and air pollution will likely become as important as a problem to Southeast Utah as it is now in Salt Lake City. A pathetic and health-destroying alteration of the beautiful clean air here would sicken my spirit. The most damaging part of the pollution is the invisible, sub-five micron particles, which the companies fail to mention because they know they do little to control them. See "High Tension in the Desert" Saturday Review, July, 1972.

I have lived in SE Utah for three years now, working as a circuit riding physician from Price to Monument Valley, often flying a light plane in the Lake Powell, Page, Four Corners, and Huntington areas. Yellow-brown haze greets me on every flight. Please spare this beautiful region and my sensitivities further insult.

Response: Please see our responses to Crall's Comment No. 1 and Phillips' Comment No. 2 in the Hearings comment section.

77. Governor's Commission on Arizona Environment

No response required.

78. Arizona Wildlife Federation

(1) Comment: In fact, we are very concerned about all the approximately 1900 miles of new access roads (870 miles permanent, 1,030 temporary) that would be required along the proposed transmission systems rights-of-way. It is

not readily apparent from the draft where these access roads would be established and we feel that critical habitat could be eradicated. Was consideration given to the fate of the desert bighorn sheep in the Black Mountains?

Response: The Draft EIS states in Chapter I that 870 miles of permanent new access roads and 1,030 miles of temporary new access roads will be needed for the transmission system. Since the participants have not identified specific locations for the new roads, it is difficult to determine the impact on critical habitat. The impact on desert bighorn sheep in the Black Mountains is discussed in Chapter III.

(2) Comment: We are concerned by the amount of input received by those preparing this DEIS from the Game and Fish Departments of those states that will be affected by this vast project. We would hope that in the Final Draft, there might be a high degree of input from these departments. One of the major limiting factors for wildlife is the availability of suitable habitat; we feel that this project will negatively effect vast areas of habitat which in turn will have a negative effect on the wildlife.

Response: Coordination and consultation was maintained with the concerned state fish and game departments throughout preparation of the Draft EIS. Much of the fish and wildlife information was provided by them. These agencies had the opportunity to review a preliminary rough draft prior to issuance of the official Draft EIS.

79. Sierra Club, San Diego Chapter

(1) Comment: The E.I.S. does not specifically identify the growth policies of the San Diego area.

Response: Refer to response to Fradkin's Comment No. 5, Hearings section. We do not know of the current growth policies, or if there are established growth policies for the city of San Diego.

(2) Comment: The E.I.S. in its analysis of the project and the alternative approaches does not use the net energy analysis now coming into use. We consider this to be a shortcoming. The net energy analysis technique can bring added information to bear on making decisions on large scale projects such as this. It can also be used to examine in totality the many proposed coal based energy production projects in Southern Utah. The E.I.S. does not even place the Kaiparowits project in view of these other proposals.

Response: See response to Beard's Comment No. 4, Hearings section.

(3) Comment: In the discussion of the sulfur dioxide removal methods, the E.I.S. considered only the stack scrubber technology. The wet lime system that was selected for Kaiparowits has the disadvantage in that large amounts, up to 1340 tons/day, of wastes are formed by the scrubbing process creating disposal and pollution problems. In July of this year, Battelle Institute announced the newly developed hydrothermal coal process of removing sulfur from coal prior to combustion. This technique does not produce large volumes of waste. Furthermore, the process will remove some of the toxic metals and part of the ash from the coal. As a by-product elemental sulfur and the residue metallic compounds are salable. As a benefit this process produces purified coal which then can be used for making pipeline quality gas or liquid fuels. This fuel would then be shipped to distant generating plants replacing the electrical transmission lines. This process has seen success at a 0.25 ton per day pilot plant but it has not yet been proven for a large scale operation capable of supplying the 3000 MW generators. A delay in the Kaiparowits project will give added development time so that the project may benefit from this new technology in the future.

Response: The section on alternatives has been expanded in the Final EIS.

(4) Comment: It is the Sierra Club's strongly held view that policy decision on energy technology must reflect true environmental costs. Therefore, the lack of quantitative trade-off data on the wet-dry tower option is a deficiency of this E.I.S.

Response: The choice between wet and wet-dry cooling towers is indeed one of trade-offs. The wet-dry tower evaporates less water, but is several times more expensive to build (a measure of the net energy and raw materials required to construct it) and requires more energy to operate. The preceding information was presented by the participants. The trade-offs then would involve the value of the water saved versus the true cost of constructing a wet-dry tower and the energy needed to operate it.

The section on alternatives dealing with dry and wet-dry cooling towers was expanded in the FES.

(5) Comment: Environmental impact statements for nuclear power plants include cumulative summary effects of air and liquid borne radiation on both the surrounding population and those occupationally exposed. Such cumulative summary effects can be compared by the lay public to the predicted levels of health and mortality hazard. Similar predictions are published for health effects of the emissions from coal-burning plants. Particularly finite, though small risks to public health and mortality will ensue from this project due to:

- 1) Occupational exposure in construction
- 2) Occupational exposures in operation
 - a) Coal mine accidents
 - b) Black lung and other miner disabilities
 - c) Limestone Quarry accidents
 - d) Power Plant system mechanical accidents
 - e) Waste handling accidents

The objective determination of the acceptability of this project must certainly include a consideration of the human lives lost and life shortening

effects. The summary portions of this report are inadequately quantized in this respect.

Response: Concur. The text in Chapter III, Socioeconomic Section, particularly the subsection dealing with the impact of Kaiparowits power plants in the Kaiparowits Plateau and quarry impact areas has been revised to include additional information related to public health. Also, see response to Phillips' Comment No. 2, Hearings section.

(6) Comment: The impact on the water quality resulting from the mining operation and waste disposal from the power plant as well as the loss of 50,000 acre feet from Lake Powell has not been sufficiently detailed in the E.I.S. Because of the millions of people who rely on the Colorado for drinking water and for irrigating the crops they consume, and evaluation of the health effects as a result of this project should be prepared.

Response: The water resources sections of Chapters III and V have been revised to more fully discuss the potential impacts of withdrawing 50,000 af/yr from Utah's remaining share of Colorado River water.

The potential impacts of the proposed project on water quality are discussed using available data; however, a statement has been added to the water resources sections of Chapters III and V regarding the project associated water quality monitoring program (part of the EPA 208 program) for detection of possible effects of the project on water quality. The intent is to protect quality of water for other uses.

(7) Comment: The E.I.S. analysis of the alternatives to the proposed project is limited in its scope. For example, solar energy is discounted as an alternative to producing 3000 MW of electricity. The E.I.S. fails to recognize the need for strategic mix of energy sources as an alternative. Solar assisted heating systems are available. Actions are being taken in Southern California

for instance, to prohibit new swimming pools to be built using natural gas heaters. This will free the natural gas for more critical needs. Solar energy can then be used to increase the total net energy. Likewise, conservation methods would have the same effect in increasing the net available energy. These conservation methods are beginning to be implemented now, not at some future time implied in the E.I.S. It is this strategy of using all alternative sources of energy to meet the total, not just electrical, market energy needs that has been ignored by the E.I.S. While the contribution from each of the sources may be small the sum effect becomes significant.

Response: See response to Coles' Comment No. 4, Hearings section. The alternative sources of energy section has been expanded in Chapter VIII of the FES.

80. R. Fenton Rood

(1) Comment: The draft environmental impact statement generally documents the environmental degradation that will result from the construction and operation of the proposed project. However, there are certain aspects of the statement that are not properly developed. My specific comments will address those deficiencies:

I feel that the section on climatology contains some errors. As a professional geographer, I can not agree with the EIS assertion that "no significant effects on regional climate could be expected." There is as yet insufficient data to make any statement concerning climatological effects.

Response: At the present time, we have no information indicating there would be a change in climate as a result of the proposed power project.

(2) Comment: The section concerning water is particularly inadequate. The operation of the power plant and its related mines will use a significant

portion of Utah's unallocated portion of Colorado River water. This use precludes alternative uses such as agriculture and recreation, but the EIS contains no evaluation of the trade offs involved. Additionally, the impact on wildlife of the lowering of the ground water table, which would result from the new town, is inadequately discussed.

Response: Alternative uses of Utah's share of Colorado River water are discussed in Chapter VIII of the EIS. As indicated in Chapter I, the State of Utah sets priorities for allocation of Utah's share of Colorado River water.

The proposed new townsite is not a wetland area dependent on shallow ground water levels. There are no wetlands to be impacted and no wetland wildlife to be affected by pumping water for the new town. The effect of the new town on wildlife that inhabits the area is discussed in the wildlife sections of Chapters III and V of the EIS.

(3) Comment: Kane and Garfield Counties will experience tremendous population growth. The EIS fails to discuss the impact of this growth on the social systems of this area, nor does it deal with the planning that will be required for basic social services. The term "proper control" in the discussion of the boom town situation is ambiguous, and certainly does not satisfy the need for analysis of the above points.

Response: The text has been revised. Refer to the section pertaining to social systems in Chapter III. The term "proper control" does not satisfy the need for analysis, but is meant to convey that plans have been developed by the Kaiparowits Planning and Development Advisory Council (and their consultants) to direct the orderly growth of the new town.

(4) Comment: Perhaps the most inadequate section of the EIS is that dealing with electrical growth rates. The planning justification for construction

of the proposed plant is based upon a projected electrical energy growth rate of 6.8 per cent compounded annually. This projection does not reflect current energy use patterns. Although the EIS notes this fact, it makes no attempt to analyze or develop more realistic use projections. New projections must be made to accurately determine the need for the proposed plan.

Response: Refer to response to Rudolph's Comment No. 6, Hearings section.

81. Jack D. Spence

Letter No. 81 was submitted to the BLM as a follow up to Dr. Spence's oral testimony at the Salt Lake City Public Hearings. The responses to this letter are the same as those given to Dr. Spence's comments presented in the Hearings section.

82. Arizona Dept. of Transportation

No response required.

83. Utah Wildlife and Outdoor Recreation Federation

(1) Comment: We would initially recommend additional, specific and encompassing studies be conducted into the complex floral and faunal communities of the proposed area before anything be decided. We have found the EIS to be incomplete in its study of nongame species of mammals, birds, reptiles, and fish in this most important transitional zone between northern and southern ecosystems.

Response: We agree that information on the many nongame species of fish and wildlife is less complete than for game species. The relatively few game species have been studied extensively for many years. The text has been revised to emphasize the lack of information available on nongame species and

on possible impacts on these species.

(2) Comment: That we as a federation cannot find adequate evidence to justify the need for this additional power in the receiver states and that the only justification for the plant seems to be monetary gains.

Response: Refer to response to Rudolph's Comment No. 6, Hearings section.

(3) Comment: Conservation of necessary power uses and elimination of unnecessary luxuries has not been properly addressed.

Response: The discussion on energy conservation in Chapter VIII has been expanded. See response to Coles' Comment No. 4, Hearings section.

84. Samuel M. Tucker

Comment: There has been a claim by one of the officials who is in favor of the plant of a definite commitment as to the source of labor: Local county people, local Utah people or people from out of state. The EIS should discuss the legality of specifying origin of work force and methods to guarantee employment of local labor.

Response: Because of mandates of several federal acts, a work force of a given composition, or from a given area, cannot be legally guaranteed.

85. Garfield County Commissioners

No response required.

86. Coconino-Navajo Counties Central Labor Council

No response required.

87. Local Union No. 184, United Brotherhood of Carpenters and Joiners
of America

No response required.

88. Utah Chapter - Associated General Contractors

No response required.

89. Marga Raskin

(1) Comment: The Kaiparowits DES is deficient in that no studies are included which provide objective demand forecasts. Such a deficiency undermines the NEPA process. The publication of an incomplete EIS not only violates the law, but it is a flagrant waste of the taxpayers' time and money and countless federal employees' energies and talents. The NEPA requirement to examine alternatives to a proposal cannot be met by merely stating that "independent predictions of future demand would be useful in assessments of the need for new generating facilities. But no such comprehensive projections have been made for the Kaiparowits market area." (DES I40) In attempting to establish a need for a Kaiparowits powerplant, it is not only lamentable but very likely illegal to only publish demand forecasts submitted by the Kaiparowits electric utility consortium.

Response: Refer to response to Rudolph's Comment No. 6, Hearing section.

(2) Comment: Unfortunately, the DES not only fails to include impartial demand forecasts but it also fails to explain why utility forecasts are considered to be "inflated and self fulfilling," and why utilities minimize the importance of energy conservation and continue to press for more powerplants in spite of "the difficulty of financing new facilities and increasing costs of new generating

capacity." (DES I40) No explanation is given regarding the structure and operating procedures of that industry in order to clarify why it is imperative that power-plant construction not cease. The DES is obliged to describe the role powerplant construction has in maintaining a viable electric utility industry.

Response: The BLM accepted the evaluation of the Federal Energy Administration that the load forecasts provided by the utilities were reasonable. Refer to response to Rudolph's Comment No. 6, Hearings Section.

(3) Comment: In spite of the fact that the "BLM sought information which could be used in preparation of the 'conservation alternatives' section of an Environmental Impact Statement," (DES A75), the FEA declines to provide those impartial analyses although that agency is cognizant of the fact that "financial use could limit electric power demand to the point where new generating capacity would not be required." It seems unconscionable that the FEA glibly brushes off responsibility for investigating those possibilities by stating: "Discussion of the costs and benefits of public policies aimed at restricting electric power demand is beyond the scope of this report." (DES A105) The DES is deficient precisely because it neglects to address important alternatives such as instituting energy conservation programs. It is not enough to admit "investment in conservation will lead to substantial monetary and energy savings." Neither is it sufficient to offer one example of a "system which provides economic and energy savings." The Kaiparowits Environmental Impact Statement must include energy conservation measures that are to be instituted prior to granting permission for the construction of that project since:

...the Kaiparowits utilities do not consider investment in conservation services to be a realistic alternative to investment in the proposed project...these utilities imply that,

legal barriers notwithstanding, they do not consider large scale investment in energy conservation programs within the scope of their activities." (DES A-125)

Response: Additional information has been included in the discussion of conservation measures in Chapter VIII. Also refer to response to Coles Comment No. 4, Hearings section.

(4) Comment: Although the FEA refers to relying on information provided by the RAND Corporation (DES A74), the DES does not reveal RAND's findings. Their research, prepared for the Resources Agency of California and California's State Assembly, with support from the National Science Foundation, found that California's electric demands could be reduced by two-thirds by the year 2000. Three years ago RAND recommended policies which would reduce California's growth rate from 8.5 percent to 3 percent.

Response: Refer to response to Rudolph's Comment No. 6, Hearings section.

(5) Comment: The DES also fails to discuss the relevance of recent Federal Power Commission figures which show that total electricity sales for the nation increased only 0.5 percent from April 1974 to April 1975. The rationale for constructing a Kaiparowits power plant is based on a 6.8 percent growth rate.

Response: See response to Rudolph's Comment No. 6, Hearings section.

90. Ben Wood, Ph.D.

(1) Comment: The statement (pg. II3) regarding the vegetation indicates ground water is misleading. The dominant vegetation is shrubgrass, shrubs, or trees which are not indicators of moisture. Big rabbitbrush is found in some of the drainages. This species requires more moisture and is found principally where intermittent streams flow.

Response: Concur. This analysis, however, is correctly stated on Page II-152 and is shown in Illustration 18 of the draft EIS. The necessary revisions have been made in the final EIS summary.

(2) Comment: The statement (pg. II4) regarding the location of the prairie dog towns is also misleading. There are some towns in section 22 of T. 34 S., R. 3 W., (SL, B&M) where some claims are located, but the area of primary concern and apparently where the highest quantity and quality limestone is located in sections 11, 12, 13 and 14 of T. 34 S., R. 3 W. (SL, B&M). There are no old or active prairie dog towns in this area. And, since the proposed quarry area is small, roads, power lines, etc., required to service the area and the haul roads can be constructed to avoid any impact to the prairie dog town, or any other wildlife species.

Response: We have attempted to make it clear that the Utah prairie dog occurs in the vicinity of the proposed limestone quarry with the nearest colony about one-half mile from the actual quarry site boundary. However, we feel the analysis (that increased traffic and human activity in the area would present a hazard) is still valid.

(3) Comment: The extent of each kind of soil could be inferred from the vegetation and could be included in the summary (pg. II2). Reference to two soil associations is found under Ecological Interrelationships but not under the Soils section.

Response: The summaries in Chapter II have been revised and updated to correct these deficiencies. However, vegetation is not used to infer soil type either in the summary or the main body of the text. Vegetation is considered the visual expression of the interaction of soils, climate and past use. Past use includes disease and insect infestations, fire, grazing and the activities of

man. Because of the complexity of past use, the Soil Conservation Service has adopted the 7th Approximation procedures for soil classification in lieu of the Russian Classification System, which utilized vegetation and climate only.

(4) Comment: Something should be said concerning the status of the transplanted antelope herd. The transplant was largely unsuccessful. A pair of antelope were seen near Nipple Spring during September 1975, but to my knowledge, these are the only ones left.

The deer herd on Four Mile Bench has drastically declined from 1972 to 1975. In 1975 it was only 16 percent of the 1972 population.

Response: The wildlife biologist assigned to the Environmental Project Staff has personally observed several antelope during the past year on East Clark Bench. However, we concur in your opinion that the transplanted antelope herd has declined greatly in numbers and is now apparently only a remnant. It is not unusual for several attempts to be required for successful establishment of a wildlife population in a new area. Our main objective was to establish the fact that the area is historic antelope range and that the state is actively trying to reestablish a herd there.

We concur that the deer herd on Fourmile Bench has declined. Populations of deer and all other wildlife fluctuate greatly. Therefore, the basic long-term capability of the habitat was considered more important than the number of animals present at a given time.

(5) Comment: The following items are from the research of the evaluation of mercury in the environment and should be considered for the final draft of the impact statement:

1. Prevailing methods of analysis were inadequate for reproducible, precise determinations of mercury concentrations. This is especially true for analyses of fish flesh.

2. Methylmercury probably constitutes less than onehalf of the total mercury burden found in organisms, especially fish flesh.

3. Bottom sediments rich in organic matter and high temperatures increase the rate of conversion of inorganic mercury into methylmercury.

4. Clay and sand substrates tend to inhibit methylation.

5. Uptake of mercury by fish is proportional to the initial concentration in water.

6. New sediments entering a reservoir will seal off existing sediments. If the new sediments are mercuryfree, sedimentation will decrease the amount of mercury entering aquatic ecosystems.

Response: The information presented above was not included in the Final Statement because it represents a situation in Ohio and was not applicable to Lake Powell. Information cited in the Final Statement indicates that Lake Powell has a high mercury content in fish flesh, whereas, the water may contain relatively low amounts of mercury.

91. Delbert Wiens, Ph.D.

(1) Comment: According to the "Endangered Species Act of 1973" (PL93205), the Congress has declared (Sec. 2c) "...that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act."

Inasmuch as no inventory of plants is given in the draft EIS, there is, of course, no mention whatever of the relatively numerous threatened and endangered plant species occurring in the Kaiparowits area. I can only conclude that this aspect of the draft EIS is woefully, if not catastrophically, inadequate.

Response: See discussion in Chapter IV where an inventory is required prior to construction. Also at present this is not legally binding, but if the

list is approved by Congress, measures to protect will be required. However, if the plant site is transferred, then responsibility passes to the State.

(2) Comment: Furthermore, the Utah prairie dog, an endangered animal, is mentioned as occurring within a half mile of the proposed quarry site, but no further comment is made. Is an EIS to be only a compendium of data without analysis? I would like to know how you, as the Director of the BLM in Utah, propose to carry out your mandate as instructed by the Congress, with respect to the Utah prairie dog and the plants mentioned above?

Response: Chapter II is primarily a compendium of data on the existing environment without analysis. Probable impacts on the Utah prairie dog were discussed on page 174, Chapter III of the Draft EIS. This discussion is retained in the Final Statement.

(3) Comment: I would also ask, where are inventory data for such organisms as mosses, algae, or fungi? The present data on insects is also shockingly inadequate. With Ph.D. holders in biology in great excess, such basic information could easily have been compiled in the course of several field seasons of comparatively little cost. I fervently hope that other sections of the Kaiparowits draft EIS are prepared in greater detail and the data subjected to analysis.

Response: Several field seasons were not available prior to preparation of the Draft Statement. Baseline and monitoring studies by Brigham Young University and Northern Arizona University, under contract with the applicants, are underway in the project area. Thus, considerably more baseline information than that included in the Draft Statement will become available soon, assuming that reports on the studies become accessible. These reports were not available for analysis purposes in preparation of the Final Statement.

We agree that baseline data should be as complete as possible so future monitoring studies could detect changes if the project were built. However, it is

our opinion that all baseline data need not be included in an environmental impact statement. Even if a complete listing of insects, algae, fungi, etc., could be included in the Final EIS, the effects from a number of significant impacts, particularly long-term ones, would still be uncertain.

92. University of Utah Research Institute

Comment: We have read with great interest the Draft Environmental Impact Statement on the Kaiparowits project. It seems appropriate to address the distribution of mercury from the power plants in a more analytical fashion.

Response: See responses to Crall's Comment No. 1 and Atwood's Comment No. 1 in the Hearings section.

93. Arizona Wildlife Federation

(1) Comment: There is one criticism which may or may not be valid. I am a hunter and sportsman and represent here the largest group of sportsmen-conservationists in Arizona. The Arizona Wildlife Federation supports responsible wildlife management and believes the various state game and fish departments have accepted this responsibility well. I resent the several undocumented statements such as (Ch. I-180) "the small deer herd in the project area apparently results from overhunting." This is inferring an irresponsibility on the part of the agency that manages this deer herd, and if it is indeed the case, it should be documented. If supporting data is present in the statement or the appendix, I could not locate it.

Response: The sentence on page I-180 has been eliminated in the Final Statement, as there are probably other contributing factors in the deer population decline. Also, for purposes of the EIS, the exact reasons for the decline may not be important. The decline did, however, begin at approximately the

time construction of Glen Canyon Dam brought increased access and human activity to the general area.

(2) Comment: This possible, indeed highly probable, increase in the mercury content of Lake Powell would be sufficient to render the lake unsuitable for sports fishing. This adverse impact is unacceptable to the Arizona Wildlife Federation. The Bureau of Land Management, before granting approval for a project such as Kaiparowits, must by law, recognize environmental effects and avoid unacceptable damage. The first has been complied with, the environmental effects have been recognized. The damage to the aquatic food chain with the probability of millions of mandays of sport fishing lost is unacceptable, and if it cannot be avoided, the proposed project must be denied.

Response: See our responses to Crall's Comment No. 1 and Atwood's Comment No. 1.

Only the Secretary of the Interior has authority to approve or disapprove the proposal. If the Secretary should approve, the Bureau of Land Management would be obligated to authorize specific grants and permits that would implement the project.

94. Irmgard Hunt

No response required.

95. Mrs. Howard Allen

No response required.

96. Susan and Craig B. Taylor; Mary J. Blomfield, James Manning

No response required.

97. Wilderness Workshop of COSC

No response required.

98. Steve Tackabery

(1) Comment: Please note that the F.E.A. report admits that it is merely using utility figures, even though independent predictions of future demand would be better. Since no adequate independent predictions exist, utility projections were used. For this reason, the section should be called "Utility Projections." It is deceptive for the EIS to present the picture than an unbiased government agency (the F.E.A.) has verified the need for the project.

Response: Refer to response to Rudolph's Comment No. 6, Hearings section.

(2) Comment: Justification of the project by simple extrapolation of past trends in electricity consumption to arrive at a projected growth rate of 6.8%/year for the market area for the next 10 (ten) years is inadequate. It failed to take into account pressures from environmentalists leading to increased energy conservation and/or fuel price changes. In view of this, the EIS itself becomes inadequate by failing to determine a comprehensive independent demand projection. The Final EIS should contain such a projection.

Response: Refer to response to Rudolph's Comment No. 6, Hearings section.

(3) Comment: The EIS seems to be biased in favor of the utilities and gives too much consideration to utility growth projection and not enough consideration to energy conservation. On page VIII-361, the EIS stated that the adoption of energy conservation measures could not obviate the need for Kaiparowits. However, Prof. A. J. Lichtenburg of U. C. Berkeley details how,

over the long run, the U.S. could save 4 percent of the energy we now use, without lowering our standard of living. Since it takes about 6 (six) 1000 MW power plants to provide 1 percent of the U.S. total energy, conserving even only onehalf as much as Prof. Lichtenburg says we can will eliminate the need for Kaiparowits. The EIS should have consulted with Berkley's Energy and Resources Program regarding energy conservation.

Response: The BLM does not have the expertise to evaluate load forecasts by power companies, therefore, we accepted the evaluation of the Federal Energy Administration that the load forecasts provided by the utilities were reasonable. The discussion on energy conservation has been expanded in Chapter VIII of the Final EIS.

99. Kane County Board of Commissioners

No response required.

100. Kim R. Wickhold

(1) Comment: Secondly, the proposed actions will consume great quantities of Colorado River water, precluding many alternative water uses. The opportunity costs of such water consumption are inadequately addressed in the EIS: alternative uses should be itemized, discussed and evaluated, and should have dollar values indicated equal to the opportunity costs incurred by precluding such uses. In addition, water quality deterioration will take place in both the Colorado River watershed and the ground water aquifers underlying the new town site at East Clark Bench (this aquifer will also be overutilized relative to its annual recharge). The dollar costs of these project effects should be assessed and itemized in the EIS.

Response: Alternative uses of resources, allocated water and the problems of cost-comparison were discussed in the Draft EIS (VIII-375), Alternative Uses of Water and Coal. This section has been expanded in the Final Statement.

The only predictable economic impact of the proposed project would be increased salinity in the lower Colorado River (III-120 of the Draft EIS). This impact is addressed in somewhat greater detail in the Final Statement. There are insufficient data from which to predict economic impact of local overdraft or contamination of ground water that could occur as a result of the proposed project.

(2) Comment: Thirdly, the social and economic impact evaluations in the EIS are so inadequate as to be insulting to both the local area residents and anyone else attempting to analyze this subject area. To itemize a few such areas of inadequacy, all of which should be addressed in the final EIS:

- 1) Socially disruptive effects of new populations due to
 - a) absolute numbers of new residents and resultant population densities.
 - b) the sociological profile of the likely new residents with relation to the present, stable, predominantly Mormon population.
 - c) the temporary, transient nature of the new population (as exemplified by their mobile home housing, etc.).
- 2) Economically disruptive effects due to
 - a) the shift of the tax base to one major, temporary source - what will happen when the plant and mine cease operation?
 - b) many municipal costs will be incurred prior to the collection of large local tax revenues - how will this tax lead problem, one of several million dollars, be overcome?

- c) how many of the newly created jobs will be filled by present local residents instead of in-migrants - will the project really alleviate any local unemployment?
 - d) what will the total cost to local governments be for providing increased municipal services, and what local governments will be called upon for which services?
- 3) Alternatives not properly studied:
- a) the local effects of having only a coal mine (and locating the power plant elsewhere).
 - b) the use of Page, Arizona, which has many facilities necessary to house the new local populations instead of a new town, transferring some of Kane County's tax revenues to Page via Title 17, Chapter 5, Sections 80-84, Utah Revised Statutes, to help pay municipal costs of the new growth, and thus possibly benefiting both Page, Arizona and Kane County, Utah.

Response: The text of Chapter III, Socioeconomic section, has been modified to consider these issues. It should be noted that specific data to assess some socioeconomic impacts are not available. It is difficult to state explicitly what the socioeconomic expenses would be for certain actions.

Alternatives are explained in Chapter VIII of the EIS.

101. Tucson Audubon Society

Comment: All transmission corridors should avoid proximity to established wilderness or primitive areas, or areas under consideration for such designation. The location and description in the DEIS of temporary and permanent access roads to be constructed to those corridors are too vague to risk impingement on existing or potential future preserves.

Response: Descriptions of and impacts to existing or proposed wilderness and primitive areas are included in the Recreation Resources section of Chapters II and III of the draft. The participants will submit a transportation plan showing the location of access roads. The plan is subject to approval or disapproval, depending on a number of items, one of which is the location of access roads.

102. William J. Lockhart

(1) Comment: Within Utah vast amounts of land are available for development that are currently vacant or nearly so. Some of this land is used for grazing purposes but other land is essentially unoccupied and is not as close to the National Parks, National Monuments, Primitive Areas and Recreation Areas as are both of the sites considered in any detail by the EIS. Possible general areas include Eastern Utah north or northeast of Arches National Park and Western Utah desert land. While additional costs may be incurred by locating a power plant in these areas as compared to the Kaiparowits Plateau, these trade-offs should have been considered in the EIS, but received no mention. There is no basis for the rationalization that the state water allotment hinges on a Kane County plant site, and that rationalization implies a preliminary conclusion that the alternatives considered in using the public domain should be governed by the existing water right interests of a particular company. Clearly this is no justification for eliminating consideration of such alternative sites within the state.

Response: See response to McComb's Comment No. 2, Hearings comments section.

(2) Comment: Of twenty-two possible sites which have been proposed at one time or another since the middle 1960's only these two have been fully

considered and compared in a manner that indicates they are actually alternatives. Of the twenty-two, it is not clear from the Draft EIS whether, or on what basis, BLM narrowed consideration to the sites at Four Mile Bench and Nipple Bench. Rather, it appears that the applicant utility companies have chosen and rejected a number of sites, and BLM simply followed their appraisals without explanation, even agreeing to consider Four Mile Bench as the "site" (I-44), and Nipple Bench as "an alternative." In effect, other possibilities have been disregarded on the basis of the companies' preferences. The two "preferred" sites have been the subject of intensive analysis by company consultants while other alternative sites have received much less attention by the company, and thus also from BLM. Unfortunately, BLM has not filled the gaps here but has followed the company preferences.

Response: See response to McComb's Comment No. 2, Hearings section.

(3) Comment: Specifically at VIII-297-298, the BLM fails to disclose its weighting factors for a comparison of some of the proposed plant sites and its only explanation refers the reader to a company study. BLM is clearly responsible for disclosing and defending its weighting factors. On page VIII-297 the BLM reports that participants ranked John Henry Bench second among five sites considered but the total analysis of John Henry Bench in the EIS occupies approximately 1 1/2 pages and refers to a lack of some critical data to fully evaluate it. This potpourri cannot properly be dignified as a decision-making tool, and reflects a basic and improper decision by BLM to leave the development and consideration of alternatives almost wholly to the companies' initiative.

Response: See response to McComb's Comment No. 2, Hearings section.

(4) Comment: As to plant sites outside Utah, many of the same problems arise as in the previous section. One problem with this section is that it

was originally drafted by the company. The entire section VIII-301 to VIII-308 fails to seriously discuss or compare the impacts of locating the plant in California, Arizona, Nevada, or Utah, or expanding existing facilities in those areas. Instead the section is limited to certain implementation problems which might be encountered in developing such alternative sites. A proper analysis would explain and compare the impacts of each of these alternatives, including comparison with the Utah plant sites discussed above. As it stands, the EIS avoids these problems, though some attempt to resolve them should be the very heart of the alternatives section.

Response: See response to McComb's Comment No. 2, Hearings section. The discussion of water use has been expanded in Chapter VIII.

(5) Comment: Rather, based on recitation of possible obstacles, such as a speculative and doubtful legal judgment about Utah's right to sell its Colorado River water allotment, the EIS avoids significant discussion of the advantages and disadvantages of that means of bringing water to alternative sites, as well as alternate means.

Response: The discussion of alternative uses of water and other resources has been expanded in the Final EIS. The July 1974 report of the Water for Energy Management Team on "Water for Energy in the Upper Colorado River Basin" (U.S. Dept. of Interior) points out that Utah's share of available Colorado River water should be adequate for all planned and proposed future developments of all kinds at least through 1993 and probably through 2000. It is likely that the entire question of water allocation and utilization in Utah will be re-examined over the next several years, but the real question now appears to be more of allocation than utilization.

(6) Comment: Another option inadequately developed is the choice of locating a plant site near the load center, but delaying construction until

non-polluting technology is developed. This question of delay or a moratorium on new plant construction is considered in the EIS but important aspects are not discussed adequately: the cumulative impacts on the environment of Kaiparowits plus any other plants existing in or proposed for the area.

Response: This question on delay or moratorium was discussed in the draft and again in the Final EIS. Also, see response to Rudolph's Comment No. 7, Hearings section. Chapter VI contains a discussion of cumulative air quality impacts with Navajo to the extent that data is known.

(7) Comment: A further alternative not considered is that of delaying the project in order to permit adequate analysis of the inflated and clearly contradictory company demand estimates. Yet, such analysis is likely to show those estimates to be overstated and to disregard both the prospect of conservation techniques and of alternative power sources. In this respect, BLM has erred seriously in justifying the entire project on the basis of demand figures which are contradictory, unsubstantiated, and wholly the company's work rather than the product of objective study and analysis. The FEA, on which BLM wholly relies, also complains about the inadequacy of available demand figures; but both agencies nevertheless proceed to use those figures as the basis for their entire analysis of the plant and for establishing its size and urgency. This approach is clearly in violation of BLM's obligation to conduct its own study of alternatives and impacts. BLM must develop independent projections of future demand and use those projections in its evaluations, rather than self-serving material submitted by the companies. More accurate projections, coupled with a cumulative impact analysis might lead to the conclusion that no plant is required or that a smaller plant would suffice.

Response: Since the Draft EIS was prepared, other independent demand projections have been made available to us, i.e., the Rand study (California's

Electricity Quandary: I, Estimating Future Demand, Rand Corporation, Santa Monica, Sept. 1972) and the California Resources Agency (Energy Dilemma, California's 20-Year Power Plant Siting Plan, Sacramento, June 1973). These projections are in close agreement. See Chapter I of the FES for specific information on demand projections.

(8) Comment: Whatever the demand levels really are, the EIS section on alternative means of meeting Project Objectives (VIII-350 to 355) is wholly inadequate and nearly useless. The conclusory language and the lack of explanation is fatal. For example, stating that "use of oil would permit siting of the plant nearer the market areas, but national shortages preclude use of this fuel as an alternative." (VIII-350) appears to be in unexplained conflict with the company's stated plan to utilize oil if Kaiparowits is not approved. While there undoubtedly are questions about the impacts of using either natural gas or oil, those alternatives must be elaborated to allow a realistic comparison between the proposal and the alternatives. The basis for the conclusions about oil and natural gas must be spelled out as well as the corresponding impacts of reliance on these resources.

Response: The section on alternatives has been expanded in the Final EIS.

(9) Comment: Similarly, the prospect of meeting demand requirements by "wheeling" of power from other load centers appears to be rejected out of hand. While there may again be obstacles to that method of satisfying demand, it is at least arguable that the United States has authority to compel such coordination in order to minimize the burden on resources. Certainly there is the possibility that better coordination of peak loads may at least reduce the size of the plant needed. Yet there is no adequate discussion of the basis on which these possibilities are disregarded.

Response: The buying and selling of surplus power among utilities is a fact of life. Modern large generating units each represent a significant fraction of a company's total generating capacity; therefore, provision must be made for (1) picking up the load in the case of a breakdown, and (2) buying surplus power to serve a utility's customers before a new unit can be brought on line. "Wheeling" of power from other load centers is taken into consideration in conjunction with each of the alternatives considered, not usually as a long-term alternative by itself.

(10) Comment: The data on geothermal energy implies that only small scale plants are feasible but makes no serious effort to discuss large scale geothermal plants such as the geysers in California with an estimated potential of 5,000 - 8,000 MW, or to consider the possibility of wet steam systems such as are used in Mexico, Iceland or elsewhere. Furthermore, the impact of one large plant like Kaiparowits versus a large number of small plants scattered over a large area is not discussed.

Response: The section on alternatives has been expanded in the Final EIS.

Authors have widely differing views as to how much geothermal power can be developed in this country. The consensus is that geothermal power is probably a small source for the immediate future. Refer to Energy Alternatives: A Comparative Analysis (U.S. Govt. Printing Office, May 1975).

(11) Comment: There clearly are different environmental as well as socio-economic impacts associated with each of these possibilities. The real question is whether some combination of alternate means of producing energy for the service area is possible which would less seriously affect the environment than the primary proposal. Analysis of that question, if present at all in

the EIS, is at best sketchy. Likewise, minimal attention is given in the appendix to wind as an energy source; but in the body of the EIS there is only brief mention at all of that alternative. There is no mention at all of the rapidly developing technology for retrieval of methane from land-center garbage dumps, hydrogen as a source of energy or oil shale development, each of which should be discussed as a possibly less destructive method of producing the "needed" power.

On the subject of oil shale, the FEA study in the Appendix (at A-135-6) suggests that development of oil shale would be a more efficient use of limited water resources; but the EIS in no way addresses that possibility in a manner that would facilitate informed decision making. The factors that should bear upon choice as between these two modes of energy production are simply not explored.

Another method of meeting project demands would be to have the companies invest in energy conservation systems. The FEA report in the Appendix at A-126 discusses this possibility, but merely reports the companies' position. The EIS lists a variety of related measures, but again offers no analysis as to their comparative costs and benefits or comparison to other alternatives.

Response: The section on alternatives has been expanded in the Final EIS. In some cases, alternatives were given brief consideration not because they had greater or lesser environmental impacts but because lack of commercial development or some other factor precluded their serious consideration.

(12) Comment: Still other possibilities remain unexplored. It is quite conceivable, for example, that arrangements might be made with Mexico to utilize Mexican oil and waste water from Mexican irrigation projects in a plant either in Mexico or on the U.S. border, with Mexican labor. Such a project would seem to involve considerably less expense both directly and in

terms of construction of transmission facilities and transmission losses. That this possibility is not beyond the appropriate scope of consideration is emphasized by another provision of NEPA which appears to have been disregarded: Section 102(E) at least suggests the need to discuss possible effects upon our relations with Mexico in light of the admitted probability of additional contamination of Colorado River waters.

While that possibility may also confront insuperable problems, the reason it is not even mentioned in the EIS is the same reason that many of the other significant alternatives are overlooked or lightly disregarded: BLM simply made little if any independent effort to investigate and define the appropriate scope of alternatives, and until too late for effective correction relied upon the applicants to present the alternatives.

Response: This alternative was not considered in the development of the Draft EIS. However, a good percentage of U.S. defense production is housed in the Southern California area, and it would appear inadvisable to entrust the production of energy for this area to a power plant located within a foreign nation. The National Environmental Policy Act requires consideration of reasonable alternatives; under the circumstances, a plant site in Mexico could not be considered reasonable.

(13) Comment: The BLM Manual 1792 requires that in determining the appropriate time to commence preparation of the statement, the Director must consider when "the earliest possible meaningful consideration of potential impact" would take place (BLM Manual 1792.12A). This requirement comports with CEQ guidelines which require that "as soon as possible . . . Federal agencies will, in consultation with other appropriate Federal, State and local agencies and the public assess in detail the potential environmental impact." 40 C.F.R. 1500.2(a).

In the Spring of 1971 the BLM Director made a determination that an EIS would be necessary for the Kaiparowits project. Yet it was not until 1974 that a core team was brought together to write an EIS, and mid-summer 1974 before the general scope of the project was defined. By this time the participating companies appear to have made final planning commitments, placing great pressure on the EIS team to produce a "justification" document. The reason for the inexcusable gap between the decision to prepare an EIS and the actual preparation is not explained in the EIS.

Response: In the spring of 1971, the project participants were interested in Nipple Bench as a site for the plant. The Secretary of the Interior initiated the Southwest Energy Study due to 6 lawsuits against the department rather than an environmental impact study. This study was released in the spring of 1973, and led to the rejection of the Nipple Bench site. In October 1973, the Governor of Utah and the participants met with the Secretary of the Interior and discussed the Fourmile Bench site as an alternative to Nipple Bench. In January 1974, the Bureau of Land Management was given the responsibility of preparing an Environmental Impact Statement for Fourmile Bench as the primary site and Nipple Bench as the alternate.

(14) Comment: As a result of its belated start on the project (among other reasons), the EIS core team faced heavy pressure from senior Interior Department officials, including the Secretary, to complete the draft statement and get the final statement completed as quickly as possible. Specific deadlines were set in the face of explicit warnings that essential studies could not be completed within the time period permitted. As a result, the EIS study team was forced to rely heavily on study or analysis supplied directly by the interested companies or their consultants. To an unacceptable and improper extent it appears likely that the scope of the studies or the preliminary definitions of their objectives were heavily dominated by the companies.

Although the EIS team made herculean efforts to rewrite materials or to supply independent and objective analysis, it did not have time to supply the needed studies or to reformulate the basic scope of the work. As a result, the EIS team was often unable to do more than edit the material to reflect a more balanced and less "justifying" tone, even to the point of repeatedly editing out words such as "will" and replacing them with "would." Under these circumstances, it is inevitable that substantial and balanced analysis would be lacking in almost every aspect of the EIS.

Response: The EIS team did everything that could be done to verify or substantiate data supplied by the participants. If verification or validation of the data was not readily obtainable within the time limits established then it was not used, either in part or in total.

(15) Comment: In particular, it is apparent that the Southern California Edison study of projected energy demand was accepted and published in the EIS as the only basis for projected energy demand. No independent study or analysis was made by BLM (as lead agency) as required by its own regulations and guidelines. See Appendix 1-1, p. A-69, Federal Energy Administration Report.

Response: Refer to response to Rudolph's Comment No. 6, Hearings section.

(16) Comment: Improper applicant involvement may also be found in BLM's consideration of alternatives to the plant sites. Only those sites proposed by the participants have been given significant consideration. Furthermore, the entire discussion of alternative sites and alternatives to the project is narrowly confined to the companies' immediate plans, reflecting the fact that preparation of the main dimensions of the "alternatives" chapter was largely the work of the applicants.

Response: The section on alternatives has been expanded in the Final EIS.

(17) Comment: The EIS is inadequate in that it fails to consider the Water Resources Planning Act of 1965, 42 U.S.C. §§ 1962 to 1962d-3 (1970), and the Principles and Standards promulgated thereunder. (Water Resources Council, "Water and Related Land Resources, Establishment of Principles and Standards for Planning," 38 Fed. Reg. 2477 et seq. (1973)). The EIS should analyze the responsibilities of the Department of Interior under this Act as applied to this project.

Response: The Water Resources Planning Act was intended by Congress to apply to "federally financed water resource projects." The promulgated standards and procedures were developed for application of the Act "to federal participation in comprehensive regional or river basin plans and for the formulation of federal water and related land resource projects."

The proposed Kaiparowits project would be a privately financed non-federal proposal for energy development by a consortium of different energy companies. It would not be a federally financed water resource project, nor would it involve comprehensive regional or river basin planning.

The water for the project was legally committed by contract and filed with the Utah State Engineer during the mid-60's by the proponents of the project, prior to promulgation of the above-referenced standards and procedures and about the time the Act was passed. The pending federal actions would deal only with proposed rights-of-way, townsite selections, approval of mining plans, etc.

(18) Comment: Finally, the failure of the Draft Statement to deal with the above problems demonstrates the wholly inadequate scope of consideration of the significant problems presented by the Kaiparowits proposal. The failure to consider the relative utility of other possible commitments of the water required for the project, and the relative impacts of those possible alternative

commitments upon alternative economic development environmental amenities, is merely one further illustration of the wholly inadequate consideration of fundamental alternatives provided by the Draft. Only regional planning and analysis can deal adequately with the key fact of life in the arid West long ago acknowledged by Major Powell: that all development, and the limits of development, must begin with a realistic prioritizing of the use of water.

Response: Refer to response to previous Comment No. 5.

(19) Comment: The Air Quality section of the Draft EIS is rife with unexplained and unanalyzed inconsistencies, fails to present or explore significant issues and leaves most important issues unresolved.

The basic standards controlling air quality decisions, which are applicable to the EIS, derive from the Clean Air Act and regulations promulgated under its authority by the Administrator of the EPA. Most important are the absolute limits on contaminant concentrations in the ambient air (the national primary and secondary standards), and the classes defined in the air degradation regulations published December 5, 1974, (39 Fed. Reg. 42510) which are applied to air below the maximum limits to establish "increments" of allowable degradation in relation to the "significance" of decreased air quality within the particular airshed. There are three such classes: Class I sets standards where any decrease in air quality would be considered significant; Class II applies to an area where moderate, well controlled growth would be considered insignificant; Class III allows rapid large scale growth with attending pollution up to the maximum limits. Each class is more precisely defined by statistical rates of degradation for particulate and sulfur oxide emissions (no other pollutants are required to be analyzed at this time). Under prevailing EPA procedures, the second worst predicted figure is that used for comparison to class increments limitations.

Response: Recent EPA information has been incorporated in the Final Statement. Also, see response to Williams' Comment No. 1.

(20) Comment: The preamble to the current air degradation regulations issued by EPA states that a coal burning power plant larger than 1,000 MW is considered incompatible with a Class II designation. This places the EIS predictions six times lower than those accepted by EPA. See 39 Fed. Reg. 42510, December 5, 1974. No possible explanation for this huge difference is present in the EIS.

Response: The difference is the result of estimated emissions. EPA assumed emission rates resulting from compliance with only the New Source Performance Standards which result in significantly higher particulate, and higher sulfur dioxide emission rates than those proposed by the applicants when 90 percent SO₂ control and 99.5 percent particulate control is assumed.

(21) Comment: At III-30 and III-47 the EIS states that if national parks 30 to 40 miles away were reclassified Class I, emissions from the power plant would probably violate that standard. But it seems improbable that emissions would not undergo some dilution in traveling that distance, and if they were so low when emitted that they barely exceeded the Class I standard it seems doubtful that they could violate that same standard after dispersing over that distance. Thus, either dilution is not anticipated for some reason not mentioned in the EIS, or the emissions are expected to significantly higher than announced at III-28. The probable explanation is that this prediction is taken from another study, the Southwest Energy Study to be mentioned in the next item, whose much less favorable conclusions are based on different tests. At any rate, complete analysis of these inconsistencies is essential. In addition, full explanation of the impact on closer and more removed parks such as Bryce (16 miles), Canyonlands, Grand Canyon (about 60 miles each), Capitol Reef (45 miles), Marble Gorge and Glen Canyon National Recreation Area (5 miles) should be included. As will be discussed later, such analysis is imperative to fully

examine environmental impact on the more important values at stake in this region, and approval should be stayed pending that correction.

Response: As shown in Figure 7, page III-28, under the inversion breakup or fumigation case shown, calculated ground concentration levels of SO_2 at 2.1 km downwind of the plant would be $187 \mu\text{g}/\text{m}^3$ for the 3-hour case and $46 \mu\text{g}/\text{m}^3$ for the 24-hour case. These concentration are 7.5 and 9.2 times the Class I limitations. Under assumed stable atmospheric conditions where the plume would be transported longer distances with less vertical dispersion, the 3-hour concentration at 19 kms downwind would be $28 \mu\text{g}/\text{m}^3$ (Fig. 6, page III-25 of the Draft Statement). This is about equal to the Class I limitation and at 25 km the concentration is predicted to be $18 \mu\text{g}/\text{m}^3$ which is still close to the Class I limitation. Additional data to the extent possible is shown in the Final Statement using additional modeling techniques for some of the atmospheric conditions.

(22) Comment: The probability that the plant will in fact be far dirtier than predicted by the EIS is further implicated at III-15, where the Southwest Energy Study is quoted to say that combined with the emissions from the Navajo plant, the national ambient air standards could be exceeded for SO_2 after Kaiparowits begins operation. These conclusions, based on Class III standards indicating the maximum pollution levels permitted anywhere in the United States, should be compared to the figures given for Kaiparowits alone at III-28: the same 24 hour rate that is 46% of the Class II limit is only 17.6% of the Class III limit. The Navajo plant is planned to be about one-third the size of Kaiparowits, so by the EIS figures, the Navajo plant should emit about 5.9% of the Class III limit (1/3 of 17.6%). Adding the two, we can expect about 23.5% of the limit to be approached. Yet the EIS at III-15 says that the Class III limit will likely be exceeded at times. Granted, as per EPA procedures this represents a second worst prediction, but so should the Southwest Energy Study forecast if

they followed the same procedures. But it requires the conclusion that the worst prediction is over 400% greater than the second worst. Either the concentration variables fluctuate wildly at this site, or this is another example fundamental failure to explain the EIS estimates in the face of serious inconsistencies.

Response: The discussion on page III-15 of the Draft Statement, citing the Southwest Energy Study, was intended to point out the potential problems the study had identified. The study, which was done in 1972, used assumptions of megawatt capacity, plant location, and emission control which bear significantly on the estimated ambient air concentration. These assumptions were used as they relate to the proposed Kaiparowits project. See revised text in the FES.

(23) Comment: A factor omitted in the EIS which alone requires disapproval is the fact that the published figures assume perfect efficiency of the pollution abatement equipment. In fact, no control equipment operates at perfect efficiency. Even if the equipment operates at 90% efficiency, not an unreasonable figure, the overall efficiency will be lowered to 89.5% from 99.5%. That is enough to radically change the whole picture, for at a minimum it will bring the SO₂ emissions well into the Class III area requiring a reclassification request to EPA before construction could begin. At any rate, it is obvious that until the consequences of lower efficiency is fully analyzed, and the basis for analysis set forth, we have no accurate basis for predicting this project's impact on air quality.

Response: Additional discussion of operating efficiencies and availability of control equipment similar to that proposed for Kaiparowits has been added to the Final Statement. In addition, consideration has been made of proposed emission controls as well as calculated emission controls required to meet air quality standards which would apply to the Kaiparowits plant.

(24) Comment: A related major omission is the failure to consider and fully analyze the cumulative impact of the Kaiparowits plant emissions when added to those present from the Navajo plant at Page, in the same basin. Nor is the collateral problem of pollution from increased vehicular activity and other pollution generated by the massive increase of population analyzed. The cumulative effects of all these various sources could be much more serious than that of the plant itself, and so of undeniable significance to the adequacy of the Impact Statement, yet they are not seriously considered. Absent that analysis, the statement is not in compliance with its legal mandate to consider all important environmental impacts. It doesn't even give us the most elementary idea of what the real impact will likely be. Again, for each of these individual reasons alone, the EIS should be disapproved at this time.

Response: The Final Impact Statement discusses the potential impacts on air quality from Kaiparowits-Navajo interaction. Additional discussion has been added concerning the significance of pollution associated with the population increase.

(25) Comment: At VIII-7 the EIS rejects the alternative of constructing in California because of the air pollution situation that prevails there. This is all done in one sentence; no further comment is made. However, it doesn't require an expert to see that this is simply absurd. The proposal to construct in California contemplates somewhere along the Colorado River in the desert bordering Arizona. From Lake Havasu/Parker Dam on the north down to Yuma on the Mexican border, there are only small towns with little or no industrial activity. There is some recreational use of the Colorado River, especially at Lake Havasu/Parker Dam, and some agriculture along the river, most notably around the Imperial Dam and Yuma. Within that area it could not be possible that the national primary or secondary limits on pollutant concentrations have been reached or that the

available Class II increment has been used up by other pollution sources. Not only is there nothing producing any significant pollution, but it is an area of strong continuous wind activity and very strong heat convection to aid rapid dispersion of any pollutants which might collect. It is between 100 and 400 miles from any sizeable population center and not within any important dispersion pattern for pollution from any urban source. Contrast this with the fact that Kaiparowits will share its air basin with the Navajo plant, in itself a strong pollution source, and recreational activity at the Glen Canyon Recreation Area probably equal to that at any point downstream in California, without predicted difficulty.

But more importantly, if Kaiparowits will barely create significant air degradation as predicted in the EIS, then why should there be any trouble about locating in California in the first place? This just does not make sense. If the plant is just barely out of the Class I bracket, it should be possible to locate in many places not far from Los Angeles itself. For this rejection of the California alternative to be valid, either all of California is far more polluted than previously imagined - or reported - or the Kaiparowits plant is going to be far dirtier than indicated in the EIS figures. Since the latter is the only plausible explanation, it would imply that the people at Resources Inc. are in fact aware of the much greater impact to be reasonably anticipated.

Response: The Bureau of Land Management has been informed by the State of California that a coal-fired power plant as "clean" as the proposed Kaiparowits plant would exceed the present California Air Quality Standards except if sited in the southern California desert. This is also substantiated by the 1972 Rand Corporation power plant siting study.

(26) Comment: First of all, in respect to view points in any of the national parks endangered here, visibility reductions of as much as 30% are not insignificant (20 miles is about 28.5% of 70 miles). It must be remembered that the primary value preserved in many of these national parks is the vistas they offer from their many overlooks. Any disfiguration or degradation of these views is therefore significant.

Response: The Final Statement has been expanded to assess the effect of sky discoloration and reduced visibility on visitors to Bryce Canyon National Park and Glen Canyon National Recreation Area (See Chapter III, Recreation - Aesthetics). The statement indicates that the visual impact could be severe. The extent of discoloration of the visual air pollutants is unknown, therefore, the effect on more distant areas such as Grand Canyon, Capitol Reef, etc., cannot be assessed.

(27) Comment: Secondly, the statement that the plume will be all but invisible except looking right on axis in the direction of the station wholly lacks credibility. It is common knowledge that the plume from the Navajo plant, currently operating at 500 mw, is quite visible. From the air, for instance, it has been spotted from as far as 100 miles away, and followed for 120 miles without being lost before the pilot had to turn away to refuel. Since Kaiparowits will be six times as large as the present Navajo activity, it is, politely, doubtful that the plume will go unnoticed. This is reinforced by the EIS statement itself. That is, if the plume is virtually invisible, how could it cause a 30% obscuration 60 miles away in the Grand Canyon? There can be no doubt that this statement on its face is no more than feeble attempt to bypass what is possibly the most important and real problem facing the public in regard to this project.

Response: Additional discussion of plume visibility has been added to the Final Statement. Also, see response to Williams' Comment No. 1, Hearings section.

(28) Comment: The failure of the impact statement to examine issues raised by the admissions referred to on pages III-30 and III-47 is a crucial one. If national park and recreational lands 30 to 40 miles from the proposed site will not be eligible for a Class I designation if this action is taken, a clearly articulated national policy of nondegradation of the air in these areas will be frustrated.

Response: Such a policy is beyond the jurisdiction of the Bureau of Land Management. To date there is no national policy on nondegradation of air quality for national parks.

(29) Comment: The national park interests cannot be over-emphasized. It is not an exaggeration to say that both in terms of quantity and quality, the Southern Utah/Northern Arizona area is the most important national park and recreation region in the U.S. Not only does it contain some of the most awesome and spectacular scenery available in the nation, but 20% of the total national parkland in the country is located in a 60 mile radius of the proposed Kaiparowits site. This includes, but is not limited to, Canyonlands, Arches, Capitol Reef, the Grand Canyon, and Glen Canyon National Recreation Area. Each individual area was created by a specific act of the Congress which mandated the greatest possible preservation of the designated lands - and air - for use by present and future generations. The same applies to the large surrounding areas proposed for Wilderness designation such as the proposed Escalante region only 20 miles north of the proposed site. The greatest flaw in this Statement is the cursory treatment these interests concerning the

whole nation have been given. Their importance is so great that to have omitted consideration of them may well render the whole statement pointless for failure to address the important impact this activity will have on other values present in the region. At a minimum it requires closer inspection of the California site alternative because of the lack of these national park interests in that area.

Response: For discussion of impacts analysis concerning the national parks, see the Recreation Resources and Land-Use, Industries and Transportation sections in Chapters III and V. Also, see response to McComb's Comment No. 2, Hearings section.

(30) Comment: Climate -- The EIS summarily dismisses as insignificant any effects upon climatic conditions, without addressing any reports or studies reaching that conclusion. Though localized effect is mentioned on page III-13, the nature or extent of that effect is not specified. There is no discussion of the possibility and effects of a "dust dome" upon weather and air currents. The probable extent of localized climatic effect is not analyzed, thereby raising the possibility of cumulative regional changes resulting from any overlap of this proposed plant with similar effects of nearby power plants.

Response: At the present time, there is not enough information available to determine whether or not there will be a regional change in climate due to the presence of the power plant.

(31) Comment: Trace elements -- The release of trace elements listed on page III-32 is based upon the faulty assumption that 99.5% of the fly ash would be removed from the flue-gas stream. This inflated percentage cannot be realistically claimed in actual plant operation. Since the EIS admits that nine dangerous elements will be released, the studies relied upon must be

carefully reevaluated in light of any change in percentage removal. The impact of mercury is critical and actual empirical studies rather than mere conjectures are needed, particularly in view of the fact that the Lake Powell studies demonstrate that game fish there are already contaminated in excess of permissible FDA limits. Finally, as mentioned on page III-35, research into the effects of fluoride pollution is "urgently needed," but is not supplied.

Response: See responses to Spence's Comment No. 1, Crall's Comment No. 1, Atwood's comments and Phillips' Comment No. 2 presented in the Hearings section.

(32) Comment: Soils -- While the EIS describes the relative increase in acre-feet runoff produced by separate components of the proposal, there is no overall explanation of anticipated erosion characteristics such as depth and direction of troughs created. The six-hour, two-year and fifty-year storms used in the calculations appear arbitrary, suggesting that actual rainfall figures from this area as collected in the past would be more realistic in predicting future impacts.

Response: No attempt was made to determine depth and location of troughs because of the vagaries of storm frequencies and durations coupled with the unknowns of clearing and construction procedures that could take place at the site. The storms used were arbitrary for reasons explained in Chapter III and Appendix III-6. Although there are no actual rainfall figures for the area due to lack of long-term weather stations, Weather Bureau precipitation-frequency maps were used for the State of Utah.

(33) Comment: Vegetation and Wildlife -- More specific data is needed as to the probable extent of damage to rare and endangered species. Much more information will be necessary in making a considered decision on these problems, because it is fully apparent that the effort to identify affected species or analyze the impacts on those species was woefully inadequate.

See letter of November 6, 1975, from Professor Delbert Wiens. The EIS merely recites species located in the general area of the proposed plant and generally declares that these species will be adversely affected to some degree.

Response: See responses to Beard's Comments No. 2 and 3, Hearings section.

(34) Comment: The EIS makes unsubstantiated predictions or assumptions as to the preferences of the anticipated workforce regarding living areas, housing, and overall life style. Large-scale construction and energy production typically attract employees who enjoy a highly volatile lifestyle. The EIS makes no mention of the effects of intermingling their flamboyant practices with the typically conservative political, moral, and religious attitudes of the current residents. The possibility of community polarization and confrontation of opposing lifestyles and attitudes must be considered.

Response: The socioeconomic sections of Chapters III and V have been modified to elaborate on some of the basic issues mentioned above. It should be understood that predictions and assumptions of work force housing preferences as reflected in the housing plans, are those of the participants. Such housing plans include not only the temporary (initial) living conditions, but also the more fixed housing plans as reflected in the conceptual new town housing plan.

(35) Comment: The opinions of current residents as to social, economic, and political issues are improperly emphasized since such opinions will be subject to massive alteration when the anticipated residents become the dominant community force.

Response: First, it is important to distinguish between attitudes and opinions. The two concepts may not be the same. (Kiesler, et al., 1969, pp. 1-154; Smith, et al., 1946; Zimbardo and Ebbesen, 1970, pp. 6-8). Opinions

are less fixed, subject to change very easily, and perhaps difficult to measure. The point is, opinions may change drastically over time due to increased knowledge and exposure to different sides of an issue. It is true that "attitudes towards development" may have been based on naive assumptions. To be fair, respondents to an opinion survey should be acquainted with all conceivable sides of an issue before a singular opinion study is conducted which may be decisive in influencing their own destiny. Also, see response to Swensen's Comment No. 1, Hearings section.

(36) Comment: The EIS does not describe the education and skills of current Southern Utah residents. There is no indication that the unemployed residents of the area are capable of filling positions in the plant or the coal mine or other secondary employment possibilities, and no data refuting the contention that a vast majority of Kaiparowits employees would come from non-Utah locations. Those residents currently unemployed could very well remain unemployed.

Response: Chapter II of the Draft EIS does not provide a detailed description of education and skills of southern Utah residents (see the following pages of Chapter II (Draft EIS) 355, 356, 385-392). Additional information regarding skills and educational backgrounds of impact area residents was not included in the Final EIS. It is probable that the majority of Kaiparowits employees would come from outside Utah. To our knowledge, there is no reason why unemployed residents would not be qualified to work in unskilled or semi-skilled positions which may arise. Such positions would probably be available during the construction phase of Kaiparowits rather than during the operational phase. Consequently, such employment would probably be temporary. Another factor that should be considered is that whoever the unemployed are at the time of employment opportunities, there is the possibility that they may not

want or accept Kaiparowits employment. Furthermore, available employment opportunities cannot be assured or guaranteed to the residents of a particular area. As indicated, many of the operational employment opportunities would be of the skilled and technically qualified job position levels. This would tend to limit employment possibilities for native residents. Refer to: Utah Department of Employment Security, Inter Office Communication, 1974; Employment, Wages, and Reporting Units by Firm Size, 1974, and Annual Report, 1974, Volume III, Labor Market Information. Finally, we do not have statistics regarding southern Utah residents, other than the reports listed above and the 1970 Census (with updates). Our data does not lead to the conclusion that Kaiparowits would substantially improve the existing socioeconomic condition (and attendant life-styles) in southern Utah.

(37) Comment: While the EIS points out several boom-town adverse effects there is no discussion as to whether such effects can be avoided even with the greatest of effort, nor is there an adequate analysis of the capacity of Utah's political and legal structure to minimize those adverse impacts.

Response: Sociological studies conducted on other similar projects reveal the difficulties of planning to resolve or control, via mitigation, the human problems associated with a large project. Also, the type of planning may result in certain sociological consequences (Long, et al., 1973, and Cary, 1970). The Governor's Kaiparowits Planning and Development Advisory Council is concerned about the problem of adverse sociological effects. Legal structures for carrying out intergovernmental coordination efforts have been established and it is the desire of federal, state, and local governments to minimize adverse impacts (Intergovernmental Planning Coordination, 1975).

(38) Comment: There is no indication of who will assume the responsibility of providing critically needed services such as schools, law enforcement

agencies, fire protection, and medical assistance. There is no guarantee that these much-needed services will become available at a sufficiently early date to serve the massive influx of residents.

Response: Refer to the function of the Kaiparowits Planning and Development Advisory Council, the counties, and the State of Utah, as specified in Chapter I. It is very difficult to guarantee the much-needed services alluded to, but it is the concern and interest of this council to assure that public services are available when needed.

(39) Comment: The cumulative effects of several large power plants in the same general area are not considered in the EIS. The proposed Garfield, IPP, and Warner Valley plants would require an overall increase in populace far above the 14,000 estimated. This much larger influx of employees would create additional demands upon required services and advanced planning, as well as increased community pressures. Exactly how the separate communities would interface in the area of scarce housing, municipal services, culinary water, highways, etc., must be considered in an overall socio-economic plan, and their cumulative impact upon the region.

Response: The importance of a regional, cumulative socioeconomic impact analysis is recognized, but it is not within the scope of this EIS.

See our response to Rudolph's Comment No. 7, and Janke's Comment No. 2, in the Hearings comments section.

(40) Comment: The EIS does not discuss the possibility of the project attracting non-energy producing, though highly polluting large scale industry. Should the plant prove to be economically successful, or prove to have an excess of power reserves, other concerns may locate in the same area, particularly those requiring large amounts of electricity. Such an effect could quickly urbanize

and industrialize Southern Utah, with resulting cumulative adverse effects upon its unique natural, scenic and environment quality.

Response: Chapters III and IV have been revised to consider some of these issues.

(41) Comment: The EIS does not adequately discuss the effect of an influx of 20,000 inhabitants upon the tourist trade. Southern Utah has traditionally been attractive to those vacationers desiring to escape an urban environment.

Response: The text has been revised in Chapter III to consider this issue. However, it should be emphasized that it is not known what effect an influx of 20,000 inhabitants will have on tourist trade.

(42) Comment: The EIS fails to examine the employment and economic effects if a coal mine, without a power plant, were opened in Southern Utah. Such a mine could provide coal to diverse areas of the country, supplying relatively smaller power plants and resulting in less environmental pollution, while still enjoying the benefits of increased employment in Southern Utah. Increased employment does not necessarily require increased pollution.

Response: The participants' proposed project includes a generation station, coal mines, new highway, new town, limestone quarry, transmission system and related facilities which have been described in Chapter I. Impact analyses of these facilities are described in Chapter III and V. Alternate plant site locations have been discussed in Chapter VIII. Since the majority of the employment and economic effects would come from the coal mine, one could interpret the effect of a "coal mine only situation" by subtracting out the other nonessential facilities and their impacts. A limestone quarry and new highway would still be needed to service and operate the coal mine, therefore, their related impacts would be added to those of the coal mine.

103. The Committee of Concern for the Traditional Indian (CC/TI)

(1) Comment: We assume this figure given in the EIS is for cooling the plant. To our reading, the E.I.S. has not clearly explained the various uses of water by the total project nor the amounts required by each use. While at one point it is implied that 41,400 acre-feet yearly will be used for cooling, at another place the plant and mine are estimated to potentially consume 50,000 acre-feet of water annually (or 16.293 billion gallons). At yet another place, the E.I.S. estimates that, at full capacity, the plant will require a total of 29,475 gallons per minute just for make-up water to the cooling system (to replace water lost through evaporation, drift losses, and to replace concentrated dissolved solids from the cooling tower known as "blowdown"). This amounts to about 1.769 million gallons per hour; 14.148 million gallons per 8-hour period; and 70.740 million gallons for an 8-hour, five-day week. In one hundred such days, 7.074 billion gallons of water will be consumed. Clearly, the E.I.S. data is not consistent, for in 200 of such days, 14.148 billion gallons of water will have been consumed for cooling alone, a sizeable excess of the figures given in other places in the E.I.S.

Response: Page I-13 of the Draft EIS gives a complete breakdown of the water used by the project. Page I-85 also explains the water consumption. Page I-87 gives a breakdown of the water use for the power plant and mine.

(2) Comment: What is the case for Utah? According to the E.I.S., the amount of Colorado River water allocated to Utah yearly is either 1.7 million acre-feet, 1.438 million acre-feet, or 1.32 million acre-feet depending upon which of three governmental reports are consulted. Hence 102,000 acre-feet a year of 1.7 million acre-feet is almost 6 percent, and 102,000 acre-feet a year of 1.32 million is more than 7 percent of Utah's yearly allotment--the proportion of Utah water that the State and Bureau of Reclamation are willing to divert from

human consumption. To get a fuller picture, let's consider other proportions. 41,400 acre-feet is a little more than 3 percent of 1.32 million acre-feet, and is 2.3 percent of an allotment of 1.7 million acre-feet. These figures give a high and low proportionate picture of water use. However, the actual water withdrawal from surface water systems (the Colorado River) has not fully been discussed because water quantities used for wet scrubbing, for washing down the coal before burning and for dust abatement have not been considered. Since the E.I.S. estimates that water withdrawal for the generating station and the mine will amount to about 50,000 acre-feet annually, this is a bit more than 3 percent of an allotment of 1.32 million acre-feet.

Response: Illustration 16, page I-87 of the draft gives a complete picture of water use. Although the water contract cited in the Draft EIS provides for an ultimate allocation of 102,000 af/yr., the proposed project would withdraw and deplete an estimated total of 50,000 af/yr from Lake Powell. It is not within the scope of this EIS to address impacts of a project where more than 3,000 MW would be generated and more than 50,000 af/yr of water consumed. The estimated 50,000 af/yr withdrawal and depletion of Lake Powell water is about 10% of Utah's remaining share of Colorado River water; this correction is included in the Final Statement.

(3) Comment: Again, as in our discussion of surface water, one must not consider the Kaiparowits impact upon ground water in isolation. The aquifers which support towns in Utah may be continuous with those in Arizona; the aquifers in the north of Utah may be continuous with those in the south, site of the instant project. Hence, much greater study must be done to clarify the total ground-water depletion picture (including the plans for other generating stations in Utah). The draft E.I.S. is sadly lacking in this feature.

Response: On the basis of generally accepted hydrologic principles and available basic data, it seems reasonable to conclude that the impacts resulting from withdrawing ground water for the new town would be local. The regional impact would proportionately reduce natural flows to the Colorado River as stated in Chapter III of the Final Statement. Also, as stated in the introduction to the water resources section of Chapter III, there is a close relationship between ground water and surface water. This implies that contamination of local ground water by the proposed project could ultimately effect the quality of water in Lake Powell and the Colorado River.

(4) Comment: The water withdrawn for use at the Kaiparowits generating plant and associated facilities will not be returned to the Colorado River. For example, blowdown water from the cooling towers (estimated in the E.I.S. as amounting to 1,735 gallons per minute) will be piped along with sewage treatment plant effluent and water from coal washing to several evaporation ponds where the water will evaporate and the dissolved pollutants will be deposited. If such evaporation ponds are adequately constructed, no flooding will occur whereby these highly polluted waters will be released into the surface drainage systems. Proper construction of the evaporation ponds is crucial for the entire Southwest is known for its sudden floods (all the streams on the Kaiparowits Plateau are subject to periods of intense flooding as noted in the E.I.S.). It appears to us that the draft EIS treats this point superficially--merely reciting the plans of the Kaiparowits designers and nowhere commenting on the adequacy of these designs. At the very least, the E.I.S. should report on the success of evaporation ponds at other power generating facilities where periodic flooding has possibly been experienced. The enormity of this pollution threat cannot be stressed enough, given the existing condition of the Colorado River, and given the potential for ruining acres of land by rendering the soils unfit for vegetation.

Response: We agree that the stock pile of salt, ash, tailings and other solid wastes pose a threat to the quality of water in and downstream from the proposed project areas. Our analysis of proposed retention structures, in the light of existing geologic, topographic and climatic conditions, indicate that those structures would be adequate during the life of the proposed project when damages (such as could be caused by a cloudburst flood) would be repaired by normal maintenance. However, they may not be adequate over the long term after abandonment of the project. This is addressed under the water resources section of Chapter III in the Final Statement.

(5) Comment: Similarly, the mitigations against pollution of surface water drainage systems by the leaching of pollutants and run-off from the mine, the limestone quarry and the ash and sulfur dioxide disposal/storage areas are questionable. At page 44 the E.I.S. describes that all run-off from the storage sites will be caught and channeled so as not to pollute surface drainage systems. These catching and channeling devices are treated superficially and inadequately by the E.I.S., again there is mere repetition of the designs and plans but no analysis or critique of their efficiency. In light of the tendency for periodic intense flooding in the region, pollution of surface drainage systems seems inevitable. Degradation of the water systems and poisoning of the land by pollutants (such as slag, sulfuric acid, and so forth) are long-lasting and serious threats. A serious matter in an already arid environment where plant, animal and human beings are already hardpressed to survive.

Response: Refer to previous response.

Regarding the comment about sulfuric acid, mention has been made in the Final Statement (Chapter III) that pyritic sulfur would be concentrated in the tailing pond. This would present a threat to water quality and the ecosystem in

Lake Powell. The potential for failure of the remaining dikes after the economic life of the proposed project is also addressed in the Final Statement.

(6) Comment: Meanwhile, another question is raised by the evaporation pond method of waste disposal: the threat to the ground-water system by the leaching and seeping of pollutants. Not only is the ground-water quality threatened at the limestone quarry, where depth to ground-water is only 50 feet, but also by the coal mines, the 60 million cubic yard ash and sulfur dioxide sludge storage area north of the plant as well as by the plant waste evaporation ponds themselves. The E.I.S. is completely inadequate on these points. First, there is not an adequate study indicating the amount of leaching and seepage expected from the storage areas, evaporation ponds and so forth. Second, while monitoring systems are planned which will detect leakage or seepage from the evaporation ponds into the surface and ground-water systems, these monitors will take about one month to detect a large leak and up to a year to detect a small leak, no such monitors are planned around or in the ash and sludge disposal areas. And, third, absolutely no recourse, no required remedy and no punishments are available by which to insure the protection of the ground and surface water systems. No means is provided for insuring the repair of such leaks and seepage.

With respect to the evaporation ponds, the E.I.S. reports that to prevent degradation of ground water, the several ponds covering about 180 acres will be lined with a 2-foot layer of mudstone with a permeability coefficient of .05 feet per year. The report fails to state what this means in actual gallons of seepage and thus is extremely inadequate on this point. Again, the EIS merely reports on what the plans are and blithely ignores any analysis of these plans. Thus, actual seepage into the ground-water reservoirs over an area of 180 acres could amount to a great deal of water. Since lime-sulfur dioxide will be a major component of the pollutants in these ponds, and since sulfur dioxide turns to

sulfuric acid easily in contact with water, the threat to the ground-water table is serious.

Pollution of Lake Powell and the Colorado River will also occur if the Kaiparowits plant is approved. Withdrawing volumes of water concentrates the pollution in the remaining water in the river. In addition, there is a major inconsistency in the E.I.S.: if none of the water used for cooling is to be returned to the river and lake, how is it explained that the concentrated salts from the cooling towers are returned to the river? Such salt deposition, amounting to 5,800 tons per year (according to the Sierra Club) will affect more than 930 acres of vegetation and soils according to the E.I.S. Salt deposition one mile away from the plant will amount to 165 pounds per acre per year, again according to the 1975 Sierra Club report. Because of the significant impact of this process, some mitigations should at least be required. Furthermore, the E.I.S. should explain or clarify this inconsistency in the final version.

Response: The possibility of leakage into the hydrologic system of pollutants generated by the proposed project has been evaluated consistent with available data. Admittedly, the data are insufficient to make a precise quantitative evaluation. This is one reason for water-quality monitoring. A comprehensive water-quality monitoring program has been implemented and coordinated with water quality monitoring under the EPA 208 program. Statutory requirements protecting water quality are addressed in Chapter IV of the Draft EIS and have been expanded in the Final EIS. The annual rate of potential leakage from the 180 acres of evaporation ponds has been calculated to be about 22.5 acre-feet (about 0.08 gal/min. per acre). This calculation assumes that all ponds would be filled to a maximum depth of 5 feet. If evaporation rates and cooling tower drift losses exceed the predicted rates, then the hydrostatic head in the evaporation ponds could be less than 5 feet and seepage losses would be less.

The calculated seepage rate of 22.5 acre-feet per year has been included in the Final Statement. Most of the concentrated salts in the cooling water remain in the evaporation ponds. The salts that would get into the natural drainage would be those deposited by cooling tower drift outside of such water retaining facilities as the evaporation ponds. Most of these salts would remain in the soil. The effect of the remaining salt that would get into the river in runoff is discussed on page III-123 of the Draft E.I.S. The salt concentration effect mentioned in the draft EIS is "a concentration of the Colorado River's salt load by reducing the volume of the river's flow by 50,000 acre-feet per year." This is explained in the Final Statement.

(7) Comment: Is not the Central Utah Project in competition with the Kaiparowits (and other generating stations planned) for use of the precious Colorado River waters? Will established communities in Utah have a sufficiency?

Response: The Central Utah Project is not in direct competition (for Colorado River water) with the Kaiparowits project. Committed allocation of Utah's share of Colorado River water is discussed on Page I-354 of the Draft EIS. For the foreseeable future, it appears that established communities in Utah (that use upper Colorado River water) will have enough.

(8) Comment: Withdrawal of Colorado River waters for one instance, may be in conflict with the Navajo Irrigation Project which was authorized by Congress in 1962, and which over these thirteen years has not progressed because of water allocation problems. Whether or not the Project is well-conceived or not, the real issue is the right of Indian reservations to their guaranteed water rights as against the allocation of these waters to power-generating facilities. The Kaiparowits plant participates in this problem, and such participation should be included in the E.I.S.

Response: Consideration has been given to deferred Indian lands in Figure 56 and page 356 in Chapter I of the Draft EIS. This same material has been included in the Final Statement.

(9) Comment: The new town alone (at either 15,324 or 9,300 persons) will be more than three times the existing population of Kane and Garfield Counties combined (i.e., 3,229 persons). The draft E.I.S. states: "If adequate housing and services are provided as proposed, very significant social impacts may be avoided" (emphasis added). Drawing a parallel with other areas where power plant development has fostered such population booms would be appropriate to an adequate E.I.S. Based on data provided by the Sierra Club (there is a lack of such relevant data in the E.I.S.), one sees a startling trend. Kane County can expect a situation like Rock Springs, Wyoming, site of the Jim Bridger plant. The Sierra Club data indicates that as the population doubled at Rock Springs: caseloads at the mental health facility have increased ten-fold in five years; emergency room admissions increased 333 percent; police calls have increased from 8,800 in 1970 to 36,000 calls in 1974; and major violent crime has skyrocketed. Local businessmen find they must compete with the wage scales offered by the new industries. These are negative socio-economic impacts. They have a price in human suffering; they also have a price tag.

Response: Chapter III, Socioeconomic Section, has been revised to discuss these social problems.

(10) Comment: In addition to conservation, there are several non-polluting, non-destructive sources of energy which have been ignored because of the ease and vested interests of continuing to exploit fossil fuels. Solar energy is sadly lacking in research funding. The use of continuous, non-depletable resources (such as solar energy) have immense relevance to continuance of human life. Wind

motion and wave power offer significant alternatives also. Lastly, waste disposal power plants (using pyrolysis) are a known alternative. These plants produce power, take care of waste disposal problems (which are considerable), and provide employment. The methane, carbon monoxide, oxygen and hydrogen produced in processing are fuel gases which power the plant. Carbon dioxide by-product if released into the atmosphere is a natural atmospheric element which plants can recycle. The cost of such plants runs to millions of dollars, not billions. By-product such as ammonia and methanol can be sold as they are a basic chemical required by many industries. These suggested alternatives come to mind, there are others of course. Primary is conservation, a law of nature too long ignored by industrially centered societies.

Response: The section on alternatives in Chapter VIII has been expanded in the Final EIS.

104. Utah Clear

(1) Comment: My first comment might be termed "energy transmission costs of alternatives." In the considerations listed in the first paragraph of Ch. VIII, p. 301 (that is to say the first paragraph of p. 301 of Ch. VIII) for locating a "large generating plant either in or outside of Utah" there is no mention of energy transportation costs.

These costs, which should be included in any evaluation, naturally include both the monetary cost of transporting energy, plus the energy cost of moving energy. Specifically, there should be a calculation of the power losses in each proposed transmission line type and routing from each of the alternative generating plant locations. Knowing the type of conductors to be used and the load to be delivered at the terminus of each power line, this can be readily calculated. Then for purposes of comparison, the energy cost (power requirement)

of moving coal from, say the Kaiparowits mine area, via (a) slurry pipeline and (b) railroad should be estimated. This figure can then be added to transmission line losses from a particular out-of-Utah plant site to the ultimate load center or connection with existing power line.

Response: The cost of transporting coal by rail, barge, truck, or pipeline on a ton-mile basis can easily be obtained from a new publication, Energy Alternatives: A Comparative Analysis (Univ. Okla. for CEQ. U.S. Govt. Printing Office, May 1975), used in the preparation of the Final EIS. However, the actual cost of transmitting electricity over transmission lines is difficult to obtain. The previously mentioned publication, which includes an exhaustive search of available literature, provides very little information that can be compared with the cost of transporting coal. However, the Betchel Study (1971) and Southwest Energy Study show costs are the same, i.e., fuel transport to load, slurry to load, or transmission lines.

(2) Comment: My second general comment has to do with solid disposal, particularly the waste from the proposed SO₂ scrubbing units. Ch. I, p. 79 indicates that about 1,340 tons of sludge per day would be produced by the scrubbers if worst grade coal were utilized. Further comment follows on the method of disposal.

My question at this point involves the volume, not the weight, of the material to be placed in the landfill site. Specifically, what daily volume of material will be placed in that site? Further, what volume of material will be/would be deposited over the 35-year estimated life of the power plant? Again, I am requesting that this calculation be made and included in the final draft of the EIS.

Response: The total amount of waste that would be placed in the disposal area was stated on page I-80 of the Draft Statement. These quantities were given in cubic yards for the projected 35-year life of the plant.

(3) Comment: Finally, in the Appendix volume, p. A-80, the statement was made that no independent demand (for electrical energy) forecasts were made, and that those of the utilities were accepted. I request that independent demand forecasts be made and compared with those of the utilities, whose projections can be construed as self-serving.

Response: Refer to response to Rudolph's Comment No. 6, hearings section.

(4) Comment: Another calculation which I would like to see, but realize that its difficulty is exceedingly great, is that of estimating the total energy requirement of building the proposed Kaiparowits power plant, including the energy necessary to mine iron ore, process the necessary amount into the steel needed in the power plant, the energy requirement of fabricating plant components from the steel and other "raw" materials, or starting materials if one prefers, the energy cost of transporting both people and components to the site, and the energy cost of plant/transmission line erection.

Only after such an estimate is made can it be said in truth that, as on P. A-98, that 25,000 tons of coal per day will displace 80,000 bbl of oil per day. Obviously this is not true until the plant becomes a net energy producer, i.e., till its output at the load centers has gone beyond the total energy needed to build the plant and its accessories.

Response: See response to Beard's Comment No. 4, hearings section.

105. Sierra Club, Southern California Regional Conservation Committee

Comment: In summary, BLM has not proposed any reasonable and viable alternate routes. In short, it appears that BLM has routed all the proposed alternate routes through such environmentally sensitive areas so as to make it appear by comparison that the preferred route is most desirable and acceptable.

For this reason alone, the draft EIS should be rejected as inadequate and referred back to BLM for completion in compliance with NEPA.

Response: The alternate routes as discussed in the full Sierra Club letter failed to mention the BLM proposed Ward Valley alternate route which was described and evaluated as a reasonable and viable alternative for the purpose of avoiding the natural and scenic areas. BLM studies all reasonable and viable routes for potential impacts to resource values. If these studies and analyses reveal a route less damaging to the environment, other than those selected by the participants, the Bureau will designate it an alternative which must be considered by the decision maker.

106. Arizona Desert Bighorn Sheep Society, Inc.

No response required.

107. League of Women Voters of Arizona

Comment: Rather than establish a new corridor in this sensitive area, we urge consideration be given to the alternatives of following either of the two existing corridors to the north or south through the Navajo Reservation.

Response: The impact statement analyzes all reasonable alternate transmission routes including those you mentioned. The Arizona Strip alternate is not the proposed route. It is called the "preferred alternate" because the participants requested use of the word "preferred." If the Secretary approves the project, he also will select the transmission routes. The analysis of impacts of all routes (proposed and alternates, will assist him in that selection.

108. Sierra Club, Uinta Chapter

(1) Comment: A genuine need for the Kaiparowits project has not been

justified. Information in the EIS justifying such need comes almost entirely from the utilities themselves. Demand increases forecast by the utilities have been seriously questioned by many experts for some time, yet no independent assessment of the need for all or part of the Kaiparowits power has ever been made.

Response: See response to Rudolph's Comment No. 6, hearings section.

(2) Comment: Another factor that should be considered here is Southern California Edison's purchase in August of 15.4% of the Palo Verde Nuclear Generating Station in Arizona. The public should be informed as to how this affects the demand forecast and the need for the Kaiparowits project.

Response: The addition of other power plant use by the participants has been added to Chapter I.

(3) Comment: Also, according to the forecasts presented in the EIS, the Salt River Project was in great need of 10% of the Kaiparowits power. But SRP pulled out of the project. According to Fig. 22 on p.VII-368, withdrawing from the project would leave SRP with an inadequate reserve margin. Why did the Salt River Project decide that this was not so? A decision on whether or not to approve Kaiparowits based on such questionable information as that presented in the EIS would be totally irresponsible.

Response: It is not known at this time why the Salt River Project withdrew from the project.

(4) Comment: I see absolutely no reason to believe that the Kaiparowits plant would produce any less pollution than is now pouring out of Navajo's stacks. Kaiparowits equipment, we are told, is designed to attain 99.5% removal of particulates, 90% removal of sulfur dioxide, and 31% removal of nitrogen oxide. But such machinery seldom achieves design efficiency. The water contract

permits particulate removal to drop to 97%, thus increasing particulate emissions by 600%, a total of 72 tons per day. The great difference between design efficiency and operating efficiency, combined with the fact that there are no sanctions or incentives to encourage the plant's owners to meet any standards, makes figures and forecasts presented in the EIS inaccurate and essentially meaningless.

Response: See responses to Spence's Comment No. 1 and Williams' Comment No. 2, hearings section.

(5) Comment: Alternative locations for the Kaiparowits project are clearly not adequately dealt with in the EIS. Nipple Bench is the only alternative site considered in any detail, and others discussed at all are all near the Four Mile Bench location. This is totally unrealistic. Other sites in Utah such as the Price area, the Southwest portion of the state, the west central portion, were apparently not even considered, nor were possible alternate locations in California, Nevada, or Arizona. The EIS here is grossly narrow-minded, seemingly intent upon screwing up the nationally significant natural and scenic resources of Southern Utah and nowhere else.

Response: See response to McComb's Comment No. 2, Hearing comments section.

(6) Comment: As well, alternate energy sources are summarily dismissed on the grounds that no single one of them can generate 3,000 mw of electricity. The fact is that no one source has to provide all 3,000 megawatts, but a combination of alternatives -- solar, wind, and geothermal energy; various conservation measures; and other alternatives--can provide enough power to meet the needs proposed to be met by Kaiparowits. The spurious dismissal of alternatives on p.VIII-8 avoids the real issue. Needs can be met without the Kaiparowits project. 3,000 mw of electricity is not needed, right now, but just one single source.

Response: The section on alternative sources of energy has been expanded in the Final EIS.

(7) Comment: Finally, the Kaiparowits project must be put in the context of the total energy development in the Southwest region. The EIS treats very inadequately the combined effects of the six existing (Cholla, Four Corners, Huntington, Mohave, Navajo, San Juan) and six proposed (Allen, Caineville-IPP, Emery II, Garfield, Kaiparowits, Warner Valley) coal-fired generating stations, as well as proposed gasification plants and mining and processing developments. The Kaiparowits project must not be treated as an isolated system. None of these various proposals should be considered independently of any or all of the others. All are in close proximity--in time as well as in geography--and all would seriously impair air quality, consume scarce water resources, require construction of thousands of miles of roads and transmission lines, require vast supplies of coal, and cause further rapid increases in population and social pressures in a sparsely-populated area. A comprehensive, regional environmental impact statement is needed to assess the collective impact of this regional development before the first step--Kaiparowits--can be taken.

Response: See responses to Rudolph's Comment No. 7 and Janke's Comment No. 2, hearings section. Based upon available data, Chapter VI of the FES discusses

109. U.S. Dept. of the Interior, Geological Survey

(1) Comment: The proposed "new town" and its impacts have been discussed with scarcely any mention of Glen Canyon City (for example, p. I-323 to I-334), which would evidently be encompassed by the development. We failed to find a description of the existing settlement. Illustration I-68 appears to show the proposed new development surrounding and encompassing the area of Glen Canyon City, but since the latter has not been clearly delineated or identified on that

map, considerable doubt remains about the relationship of the two settlements. Illustration I-67 shows the new townsite as completely contiguous with Glen Canyon City. By contrast, Illustration I-69 shows each settlement completely distinct, and four miles apart. The most detailed map, Illustration I-68, on the other hand, shows a single settlement encompassing what appears to be the major part of both communities within a single perimeter road having an average diameter of only 1.4 miles. The overall length of the combined community, as shown on that map, is 2.8 miles, while on Illustration I-67 it is 4.3 miles and has a very different configuration from that shown on Illustration I-68. It would be helpful to clarify these relationships.

Response: The exact location of the proposed town, particularly in reference to Glen Canyon City, has not been determined. However, revised maps in Chapter I note the general location of the site. A proposed marshalling and construction yard would be contiguous to Glen Canyon City.

(2) Comment: The effects of the proposed action on the chemical, biological and physical quality of surface water are adequately discussed and the proposed mitigating measures should assure minimum impact on the hydrologic environment. We suggest one improvement, however. The environmental statement indicates that evaporation ponds and sanitary waste ponds will be monitored for leakage to assure no degradation of ground water or return of waste water to Lake Powell (p. 1-101). The chemical-quality monitoring program should also include selected areas of Lake Powell in order to detect either seepage from evaporation ponds, tailings ponds, and sanitary waste-water ponds that may not be detected by on-site monitors or runoff from the project area that may tend to increase the salinity of the lake. Increases in salinity of drainage from Lake Powell may influence any increases in salinity of the Colorado River resulting from the proposed action.

Response: Concur. A comprehensive water-quality monitoring program was initiated in the summer of 1975 by the participants in coordination with the EPA 208 water-quality monitoring program. The network includes stations in the Warm, Wahweap and Lost Chance arms of Lake Powell as well as stations at upper and lower reaches of Warm, Wahweap and Last Chance creeks.

This water-quality monitoring program is addressed in the Final Statement.

(3) Comment: Ponds are to be lined with a two-foot layer of mudstone having a permeability coefficient of 0.05 feet/year (p. I-100 to I-101). We would like to know whether the linings are to consist of crushed material from the mudstone that has been compacted or cemented, or consist of blocks cemented together. Is the stated permeability of laboratory or field determination applicable to undisturbed mudstone, or is it the predicted permeability for the liner in place? Inasmuch as the liner is intended to provide pond integrity against leaks for the projected 35-year life of the plant, it is part of an important mitigating measure proposed to protect ground-water resources. The statement should explain this matter more adequately. Further, for proper appraisal of the impact evaluation, the statement should describe the mineral and textural nature and pertinent properties of the mudstone both in its undisturbed condition and after use in the liners. If no cementing is planned, it should be explained how slumping and loss of integrity will be avoided on the flanks of the ponds.

Response: The participants have not made this information available to us. However, evaporation pond liner integrity is discussed in Chapter IV, Mitigating Measures. The impact of liner failure (seepage) is also discussed in Chapter III of the FES.

(4) Comment: The monitoring system around the ponds should be more fully explained. According to the draft statement the depths to ground water will be

fairly great, up to 1,000 feet or more, if the principal aquifer is monitored (p. II-3). Of course, there is always the possibility that perched water bodies may underlie each pond, perhaps at depths of 150 to 200 feet.

Nevertheless, there seems to be a good possibility that any pollutants escaping from the ponds may initially move downward and not laterally through unsaturated or dry rocks for hundreds of feet before entering the regional flow of ground water. Will the monitoring wells be drilled to perched bodies, if they are found under each pond, or to the principal aquifer (the Navajo Sandstone)? Or will slant drilling also be used to try to intercept pollutants beneath the ponds before they enter the principal ground-water reservoir? About how many monitoring wells are planned and roughly what distribution are they to have?

Response: The potential for contamination of water in the principal aquifer (Navajo Sandstone) by leakage from evaporation ponds is very remote because (a) several thousand feet of relatively impermeable rock (including the Mancos shale) separate the Navajo from the ponds (b) shallow ground water that could be contaminated by leakage from the ponds would most likely drain by seeps or springs to nearby deeply incised canyons. This is pointed out in Chapter III of Statement. The participants do not propose to drill monitoring wells through the Navajo sandstone. An unspecified number of wells would be drilled around the evaporation ponds to detect leaks. In addition, about 24 surface-and ground-water sampling sites have been established under the project-associated water quality monitoring program.

(5) Comment: On page I-152 the statement is made that mine-drainage water would be recycled for use underground and that if excessive quantities of water should be generated, any surplus over mining requirements would be piped to the coal preparation plant. On page III-115, however, the text states, "Water produced at the mines would not be returned to the ground-water systems or released

to streams. This would result in depletion of a number of seeps and springs . .
." The significance of these two statements should be clarified and any possible
differences reconciled.

Response: Concur. Clarification is warranted and the text has been
revised. The observation made on p. I-152 is a common and often necessary coal
mining practice. Water used to control dust generated in mining operations would
leave the mines mixed with raw coal. Sump pumps would remove most excess water
to the surface for use in the washery as stated. Some water may seep into mined-
out voids. The referenced text on page III-115 of the draft has also been re-
vised accordingly in the Final EIS.

(6) Comment: Page I-6, par. 2 - The figure of 47,128 acres should be modi-
fied to account for exchanges with the El Paso Natural Gas Company and to agree
with the figure of 47,767.79 acres given on page A. 156.

Response: Concur: The text has been revised.

(7) Comment: Page I-6, par. 3 -- For clarity and emphasis the first
sentence should be extended to read" ...covered conveyor belt approximately seven
miles long to transport clean coal to the generating station at Four Mile Bench."

Response: Concur. The text has been revised.

(8) Comment: Page I-8, par. 3 -- The limestone quarry is described as
"approximately 16 miles northwest of Bryce Canyon National Park" here and on page
I-251 but as approximately "20 miles north" of the park in the Summary (following
the title page). However, Illustration II-4 shows the proposed quarry site to be
11 miles from Bryce Canyon National Park in a north-northeast direction.

Response: Concur. The text has been revised.

(9) Comment: Page I-116, par. 3 -- Change the acreage from 47,128 to 47,767.79 and include Range 2 in the description, shown in illustration 21.

Response: Concur. The text has been revised.

(10) Comment: Page II-68, illus. 8 -- It would be useful to identify the site of the coal mine, on the bench between Warm Creek and Last Chance Creek.

Response: Concur: The text has been revised.

(11) Comment: Page II-71, illus. 10 -- A credit line should be added:
"From Doelling and Graham, 1972."

Response: Concur. The text has been revised.

(12) Comment Page II-73, fig. 23 -- Credit line should be expanded to read
"Modified from Doelling and Graham, 1972."

Response: Concur. The text has been revised.

(13) Comment: Page II-78, par. 4 -- The original "Illustration 10" intended to show transition of coal zones has been omitted. We recommend deletion of the sentence. The present illustration 10 is a generalized geologic map.

Response: Text revisions made it possible and desirable to include Illustration 10. Deletion of sentence, therefore, was unnecessary.

(14) Comment: Page III-61, par. 2 -- The thickness of "20 to 25 feet should be changed to "30 to 35 feet," in agreement with last paragraph on this page.

Response: Concur. Source data have been reevaluated and impacts reassessed. The text has been revised accordingly.

(15) Comment: Page IV-11, par. 2 -- we believe the reference to OSHA is at least partially in error. Respirable coal dust standards were drawn up by HEW

and U.S. Bureau of Mines for inclusion in the Federal Coal Mine Health and Safety Act of 1969. These provisions were subsequently enforced by the Health and Safety arm of USBM until the Mining Enforcement and Safety Administration (MESA) replaced the Health and Safety portion, USBM, in 1972. However, it is possible that OSHA has adopted similar guidelines for its areas of responsibility, which do not include coal mine and coal mine surface facilities. The latter are strictly under MESA's jurisdiction. OSHA does, however, cover industrial facilities, such as a power plant per se, and probably the seven-mile coal conveyor to the power plant in this instance.

Similar comment applies to the reference to OSHA in the last paragraph of page IV-19. These working stations in a mine or within surface-related facilities are strictly within MESA jurisdiction and OSHA has no authority whatsoever. The remaining references to MESA on page IV-20 are correct and proper.

Response: The reference to page IV-11 of the Draft Statement is to the proposed generating station, where OSHA requirements would be enforced. Reference to OSHA on page IV-19 was in error. However, both referenced paragraphs have been removed from the Final Statement because revision made them redundant.

The distinction between the authorities of OSHA and MESA has been made in Chapter IV of the Final Statement.

(16) Comment: Page IV-20, last par. -- Mitigating measures to prevent subsidence alluded to here, although discussed In Chapter I and on page IV-31, should also be emphasized here with a reference to page IV-31, even at the expense of repetition. Subsidence may be one of the greatest impacts of the project.

Response: This subject has been reevaluated and the text in the Final Statement revised where necessary.

(17) Comment: Page IV-30 -- Regulatory enforcement power of the U.S. Geological Survey as to Coal Mining Regulations, 30 CFR, Part 211, should be mentioned here. This matter deserves more emphasis than it is given on page IV-31.

Response: Concur. The text has been revised.

(18) Comment: Page VIII-63, par. 1 -- Reword to read "... 40 feet or more of thickness," since some coal beds not technologically recoverable by underground methods could be mined by the open pit technique.

Response: The coal beds, based on core drilling studies, are 30-40 feet in average thickness; therefore, the text was changed to read "30 to 40 feet in thickness." The open pit mining method will not be used at Kaiparowits.

(19) Comment: Page VII-64, line 7 from bottom -- Change "seam" to "bed".

Response: Concur. The text has been revised.

(20) Comment: Page VII-67, par. 2 -- It should be mentioned that additional water would be required to mix with pulverized coal to produce a slurry and special equipment would be needed to make the mix. In addition, dewatering equipment would be needed on the delivery end. This method would take up more acreage and contribute to surface disturbance and other impacts.

Response: Because this method of coal transportation was not considerable a reasonable alternative, additional discussion was not necessary in the statement.

110. Northern Arizona Council of Governments

(1) Comment: The loss in tourist spending may, in the long run, exceed the income added to the area due to plant, mine and transmission line construction. We do not know that this will happen; we certainly hope that it does not. We are, however, not reassured by the Environmental Impact Statement which, we

believe, pays insufficient attention to the relationship between air quality and tourism and to the question of mercury contamination of Lake Powell.

Response: No effort was made to determine the loss in tourism since there was insufficient information that could be found to make an estimate of this nature. It is conceivable that visual air pollution and mercury content in the larger predator fish would result in loss of tourists but the exact extent of such loss is unknown.

(2) Comment: It is our understanding that cost of generating power at the Kaiparowits plant is estimated to be very high by present standards (perhaps over 30 mills/KWH) so that consumer resistance to high energy costs must be considered in forecasting future demand. Since no independent energy demand forecasts have as yet been made, the services of a well known and competent organization, such as the Rand Corporation, should immediately be engaged to produce an independent estimate of future electrical power demands for each of the remaining principals. The results of this independent demand forecast should then be compared with the demand forecasts used in this EIS. (This proposal was suggested by the Federal Energy Administration on page A-80 of the Reference Material volume of the EIS.) Of particular concern are the revised 1985 demands and how these are related to energy conservation measures and the ever-increasing cost of electrical energy. The size and scheduling of the plant should then be re-examined, as well as the use of other generating facilities.

Response: See response to Rudolph's Comment No. 6, hearings section.

111. George R. Barker

(1) Comment: The Kaiparowits report is incomplete in many ways. It presents a case for the project, but omits many aspects which must be available to anyone evaluating the project. For instance, it does not show that a transmission line

paralleling the existing installation between (a) EL DORADO and (b) SERRANO by way of (c) LUGO and the (d) CAJON PASS would be approximately 100 miles shorter than the one proposed by way of (e) DEVERS and the San Gorgonio Pass. The Lugo corridor would consume approximately 8000 acres less in actual rights of way and 24,000 acres less in the pre-empted 2000 foot separating space between the two corridors than the (f) San Gorgonio Pass route. This is an inexcusable waste of natural resources.

Response: The purpose of the statement is to analyze impacts and reasonable alternatives and not present a justification for the project. The transmission routing (Lugo-Cajon Pass) is already heavily impacted with several right-of-ways from major transmission lines, an interstate highway, railroad and underground pipe lines. In addition, several more major transmission lines are proposed from the Lucerne Valley power plant and the Allen-Warner Valley power plants (plus several additional major lines within the urban areas). This raises the question of system reliability. The transmission system experts indicate that reliability is extremely important. By widely separating major transmission lines, the chance of a "black-out" is greatly diminished. If all lines were located in narrow Cajon Pass, a major airline crash, earthquake or fire could conceivably shut down power to a large area on the West Coast. As may be noted in the Bristol Mountain alternate, the 2,000 foot separation proposal would still be part of this proposal.

Finally, a more southern routing would provide a more direct route to market areas in San Diego.

(2) Comment: One questions the whole report when it is discovered that the public utilities request at the Federal level for a line from the Devers substation west through the San Gorgonio Pass makes no mention of the application they have at state level for a line east to the Devers substation through the San

Gorgonio Pass. It would seem they are confused and have not coordinated their plans.

Response: The proposed 220 kV ac transmission line, which will transport power west to east, is an interim line necessary to bring additional power to the Palm Springs area.

(3) Comment: The minimal consideration in the Environmental Impact Report of all the present non-electric transmission corridors in the San Gorgonio Pass may have been due to ignorance, but to consider only the effect of the electric lines makes the omission look deliberate.

Response: The main reason the impact of rights-of-way through San Gorgonio Pass was not discussed in more detail is because the proposed Kaiparowits transmission lines would be located some distance south of existing rights-of-way in the pass. However, the proposed transmission lines would cross the other rights-of-way past Devers substation. In addition, Chapter VIII of the FES considers the alternatives of using existing transmission line systems by upgrading them to higher voltage levels.

(4) Comment: Up to the present time, no public report by a government or other agency has given any consideration to the cumulative impact of the various types of corridors. Nor has there been a study of how many future transmission lines of every type might be needed to and from Southern California and what the alternate routes might be. Which product should have priority? Is any consideration to be given to the cities of Banning and Beaumont or the Tribal Council of the Morongo Indian Reservation when their environs are degraded again?

Response: No thorough regional study has been compiled to determine transmission line siting and cumulative impact of transmission lines or corridors. However, some data is available in the Southwest Energy Study as well as a corridor analysis completed by McDonnell Douglas for BLM and a similar study by Harvey

Hunkins, Bureau of Reclamation. Chapter VIII contains an alternative analyzing the impact of upgrading the existing transmission system to higher voltage levels.

112. Nevada Power Company

No response required.

113. Friends of the Earth, Inc.

(1) Comment: Developed alternatives to the proposed action were not discussed in a comprehensive manner nor developed systematically in a way which would outline the specific contours of each alternative. The alternatives discussed in the draft EIS do not provide the necessary information with which to evaluate their full environmental consequences.

Response: The section on alternatives has been expanded in the Final EIS.

(2) Comment: A number of subjects including those discussed in this statement need substantial improvement before the Congressional intent of the National Environmental Policy Act can be achieved. The draft EIS fails to inform the reader as to the exact nature of the proposal. A 3,000 megawatt plant is evaluated although the participants are quite willing to expand the plant to 6,000 megawatts in the near future. The participants have found a 25,000 megawatt facility could be built at the proposed site without significant danger of exceeding the limiting three-hour sulfur dioxide standards (VIII-221). Such a plant would be eight times larger than the one currently proposed. The Kaiparowits final EIS should inform the public as to the exact nature of the proposal.

Response: The participants propose to construct a 3,000 MW power station at the Kaiparowits site. The Draft EIS considered future enlargement from 3,000 MW to 6,000 MW and even to 25,000 MW.

(3) Comment: What will be the cumulative effects of power developments to the Colorado Plateau region? The draft EIS states (I-345) "cumulative impacts, if any, will be specifically set out in subsequent parts of the statement." A subsequent part of the statement (VI-5) reveals the uncomfortable conclusion, "there is presently insufficient data for fully evaluating potential long-term cumulative effects of the current energy development scenario on air resources, visibility, and elemental buildup."

Response: See responses to Rudolph's Comment No. 7 and Janke's Comment No. 2, hearings comments section. Chapter VI to the extent data was available discusses the cumulative effect of Kaiparowits and Navajo.

(4) Comment: The lack of detail in Chapter VI, "The relationship between local short-term uses of man's environment and the maintenance enhancement of long-term productivity," containing 18 pages, and the near absence of Chapter VII, "Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented," containing all of 6 pages, seriously question the validity of the report as a whole.

Response: These chapters have been rewritten for the Final EIS; however, due to lack of specificity in the comment, we were unable to exactly determine the inadequacies you have mentioned.

(5) Comment: The draft EIS should not so blatantly dismiss the widespread opposition to this project by large numbers of people. "A small coalition of resident and non-resident conservationists would be disappointed if the project were approved" (III-11). Should this statement appear in the final EIS, something appropriate should follow: "However, a much smaller coalition of resident and non-resident corporate executives, federal administrators, and Utah politicians would be disappointed to a lesser extent if the project were not approved."

Response: The text of Chapter III has been revised.

(6) Comment: The decision to construct the proposed Kaiparowits power project stems from certain assumptions about future demand for electricity made by the three participating utilities, Southern California Edison Co. (SCE), San Diego Gas and Electric Co. (SDG&E), and Arizona Public Service Co. (APS). These assumptions were manifested as forecasts of future electrical demand presented by the three utilities in the draft EIS. Specifically, SCE predicts a 4.6% average annual compound growth rate in peak demand in its market area during the period 1975-1985, SDG&E predicts a rate of 7.4% and APS predicts a rate of 8.3%, yielding an aggregate rate of demand growth of 6.8%. There is no justification presented in the EIS for this growth in demand. Per capita use of electrical energy is also predicted to grow in the future, but no rationale at all is presented in the EIS explaining these continued growth rates in lieu of evidence accumulating to the contrary.

Response: Refer to response to Rudolph's Comment No. 6, hearings section.

(7) Comment: A delineation of exactly how every additional kilowatt-hour will be used would be appropriate, but the EIS should contain at least an explanation of the forecasting methodologies employed by the participating utilities. Robert Beck and Henry Myers of the Federal Energy Administration (FEA), referring to the proposed Kaiparowits project, conclude: "Those projections which have been made either are insufficiently detailed or rest on assumptions considered too speculative as a basis for planning." The presentation of forecasting methodology in the draft EIS, in conjunction with appropriate data would allow interested parties to arrive at their own conclusions regarding the need for increased electrical generating capacity. Beck and Myers further conclude that: "Recognizing that demand forecasts must necessarily reflect many subjective

judgments, the FEA believes it important that there be forecasts compiled independently of those produced within the electric utility industry." Such an independent forecast is absent from the draft EIS and should be included in the final EIS.

Response: Refer to Rudolph's Comment No. 6, hearings section.

(8) Comment: We are now entering an era of history when investment in conservation is more beneficial to society than construction of new generating capacity. Studies have shown where it is less costly to save a kilowatt than to construct a kilowatt of new capacity. Conservation as an alternative to the proposed Kaiparowits power project unfortunately receives inadequate treatment in the draft EIS.

Response: The discussion on conservation alternatives was expanded in Chapter VIII. Also, see response to Cole's Comment No. 4, hearings section.

(9) Comment: Population projections are used as variables in demand models accounting for 50% of SCE electric sales. Proper documentation of these projections is absent from the draft EIS and there is good reason to question the 1.7% projection presented. The absence of a well specified model prevents interested parties from duplicating these projections and examining the methodology.

Response: The evaluation of the Federal Energy Administration that the load forecasts provided by the utilities were reasonable was accepted. However, the Rand Report on estimating future demand, referenced in Chapter I, states that, "Moreover, there is no assurance that similar input data have been used. For example where population is an input factor, different utilities may rely on any one of several projections that the Bureau of Census provides."

(10) Comment: Long term alternatives involve the shifting of our energy sources from the depletable, "dirty" fossil fuels that we now burn to less polluting,

renewable sources. Such mid and long term alternatives include solar energy, heating and cooling applications and solar electric generating plants, wind energy, and geothermal energy. Coupled with conservation and the exploitation of renewable sources should be a decentralization of our electric generation facilities. As a short term alternative, conservation is adequately dealt with in the draft EIS.

Response: Chapter VIII, Alternatives, has been expanded in the Final EIS.

(11) Comment: It seems that large amounts of information in the air quality section of the draft EIS were supplied by the participants of the proposed project. The participants have a self-serving interest in only providing information which would be beneficial to their proposal. One would not expect them to present any data which would jeopardize approval of the project. This was apparent while reviewing the document.

Response: BLM has requested and obtained from the participants copies of each air quality study cited and used in the statement for impact analysis review. The results have been supplemented with other source studies wherever possible for comparison and to further evaluate potential impacts.

(12) Comment: It is interesting to note that in the draft EIS only the results of the Intercomp model are given. It is not until the errata sheet of Chapter 3 that results from any other models are given. Here the NOAA model presents predicted results for ground level SO₂ concentrations 5 to 20 times higher than those calculated by the Intercomp model. Yet, according to the errata sheet, these higher levels, "are still within both the ambient air quality standards and the significant deterioration regulation limitations." However, the data given only predicts SO₂ concentrations on a one and three hour basis. According to the Denver EPA regional office, calculations of 24-hour concentrations

based on the NOAA model predictions indicate that SO_2 levels at the south end of the Kaiparowits plateau will violate the Class II limitation.

Response: See response to Phillip's Comment No. 1, Hearings comments section.

(13) Comment: Calculations done by Dr. Michael Williams indicate that SO_2 concentrations in Bryce Canyon National Park would be expected to exceed Class I increments. There is a good chance that the National Parks in the region will be reclassified Class I. The final EIS should discuss the implications of reclassification as it concerns the significant deterioration of regional air quality.

Response: Dr. Williams' data has been incorporated in the Final EIS as well as a discussion on the significant deterioration of regional air quality and effects on the National Parks in Utah.

(14) Comment: Plume interaction of Navajo and Kaiparowits and their combined synergistic effects could seriously jeopardize the environment of the Lake Powell basin. Potential health hazards, reduced productivity, and degradation of air quality should be better understood so that a meaningful review of the air quality problems can be made.

This and all other air quality assessments should be presented in an objective manner in the final EIS by parties not directly involved in the project. This will help to insure against a conflict of interest which is now apparent in the draft EIS.

Response: The air quality data presented in the Final EIS has been reviewed by representatives of the Environmental Protection Agency and the Lake Powell Research Project. Independent air quality assessments have been presented in Chapters III, V, VI, and VIII of the FES.

(15) Comment: The draft EIS makes persistent mention that mitigating pollution control equipment will reduce emissions by 99.5% (by-weight) for particulates and 90% (by-weight) for SO₂. This assumes that the emission control equipment will function at maximum rated efficiency. Unfortunately, these systems can only function at these "designed efficiencies" for brief periods of time under ideal conditions. Experience shows that over the long-term, systems designed at 99.5% capacity will only operate at approximately 97%. As examples, the enclosed list of precipitators describes 15 units and their design efficiencies together with present estimated actual performance in the TVA system. As the table indicates, only two of the 15 are meeting design efficiency

Response: See response to Spence's Comment No. 1, hearings section.

(16) Comment: While the participants have committed themselves to achieving 99.5% and 90% efficiencies, there is no guarantee that they will be able to meet these figures. Page IV-1 of the draft EIS states "it is assumed the participants would act in good faith in carrying out the mitigating actions to which they have committed themselves in writing." It is interesting to note that the federal water contract makes it necessary for the participants to remove no less than 97% of particulate matter from stack emissions in each month and not less than 96% in any 24-hour period. One method of assuring that the participants comply with their written commitment is to require a surety of performance bond. This could be accomplished separately or as an amendment to the federal water contract.

Response: The only guarantee that the participants will meet the stated efficiencies is the administration of state air quality standards by the appropriate state agency. A surety of performance bond would only apply if the land in question remained in federal ownership. Any amending of the water contract would require a legal interpretation by the Secretary of the Interior.

(17) Comment: The existing Navajo plant has often produced a conspicuous brown haze throughout the Lake Powell region. Will Kaiparowits add to this problem? More than once in the draft EIS (III-38, II-14) it is stated, "studies by the Bechtel Power Corporation (1974) have indicated that brown discoloration would not be noticeable unless the observer was looking along the plume axis." However, the next sentence on page III-38 states, "experience to be gained with observations at Navajo will be valuable on further assessing this problem." The problem is assessed and spelled out on V-14. "The plume at Navajo is quite noticeable at any angle." It would seem reasonable to assume that the Bechtel studies were based on highly questionable parameters. An independent analysis of this problem should be included in the final EIS.

Response: Data pertaining to the Navajo power plant and possible interaction with the proposed Kaiparowits power project are presented in Chapter II. Additional air quality modeling data has been included in Chapter III.

(18) Comment: Are we to believe "scientific studies" or "actual observations" in assessing the effects of stack emissions on the Glen Canyon National Recreation Area and nearby National Parks? The draft EIS contains far too many "unknowns" and "incompletes" to properly consider the true adverse impacts of the project. The large gaps in essential data make a balanced decision impossible.

Response: Refer to the Recreation and Land Use sections in Chapter III of the Final EIS for impacts on recreation areas and parks.

(19) Comment: The draft EIS states, "no significant effects on regional climate could be expected" if the proposed action were implemented (III-13). This statement has little, if any, credibility. The National Oceanic and Atmospheric Administration (NOAA) is currently conducting studies in the Four Corners area in order to gain the necessary information with which to determine the effects of large scale coal related energy development on regional climate. A

NOAA spokesperson has said, "it is reasonable to assume that there is as yet insufficient data to assess the long-term meteorological consequences of coal development." This discrepancy should be corrected in the final EIS.

Response: Based on currently available information, the climate in the Kaiparowits area would not be adversely affected if a coal-fired plant was constructed.

(20) Comment: Large scale coal-fired power plants emit quantities of trace elements which are known to be hazardous to all biological species. The extent to which these elements enter the ecosystems is not well documented. However, a lack of documentation should not be assumed to correlate with a lack of significance.

Response: See responses to Phillip's Comment No. 2, Atwood's comments and Crall's Comment No. 1, hearings section.

(21) Comment: The Kaiparowits draft EIS recognizes the three main sources of trace element contamination related to the project: generating station stack emissions, tailings pond discharge, and leaching from ash and solid disposal areas. In the draft EIS, the impact of trace elements from these sources is related to air, water, soil, vegetation and wildlife. Although these problems are outlined, lack of data is often cited as a reason to treat trace elements as an incidental problem which should be monitored. Evidence from past developments indicates that trace element toxicity could be a problem of great enough magnitude to seriously effect the health of plants, animals, and man in the entire area. Therefore, more serious consideration should be given to dealing with harmful contamination.

Response: The Bureau of Land Management assessed the impacts of trace element emissions using the available and most recent information. This information was presented in the Draft EIS in relation to impacts on air, water, soil, vegetation and wildlife. However, the Draft EIS also clearly indicates that lack

of data prevents assessment of impacts associated with trace element emissions to the degree of depth and detail that would be desired by decision makers, conservation organizations, and regulatory agencies. Our aim in clearly indicating this lack of data was to draw attention to this fact because of the potential problem of trace element accumulation in toxic concentrations. The problem of trace element toxicity and associated health hazards was discussed on pages III-31 to III-36, III-72, III-73, III-153, and III-154 of the Draft EIS.

We believe the emphasis this problem received, including identification of data gaps, showed real concern for this problem. The Bureau of Land Management does not have the authority, since it is not a pollution regulatory agency, to deal directly with the problem of harmful contamination of toxic trace elements. We do believe the potential problem was adequately addressed in the draft EIS to alert and inform the decision makers, the public, and regulatory agencies.

(22) Comment: The 12.5 tons of particulates emitted daily from the proposed Kaiparowits project under ideal conditions would indeed be of a very toxic nature due to the small size of the particulates. The draft EIS does not qualitatively describe the 12.5 tons of particulates and the extent to which these elements could affect the area. A closer look at some of the elements contained in the emission is helpful in assessing the magnitude of the problem.

Response: Refer to responses to Phillips' Comment No. 2, Atwood's comments, and Crall's Comment No. 1, hearings section. Also, health effects are discussed in Air Quality section, Chapter III of the FES.

(23) Comment: Radioactive emissions are not dealt with qualitatively: A listing of radioactive elements in the coal (radium-228, thorium-232, radium-226, and thorium-230) is made and a total radioactivity concentration of 0.77 pCi/g is listed. The hazard associated with these elements and the half lives of the

isotopes are not mentioned. Instead it is stated that "no measurements are being made of atmospheric radioactivity in the Page or Lake Powell areas (II-39)." The long-term genetic changes that could be induced by these elements should not be overlooked.

Response: See responses to Cox's Comment No. 1, and Zorn's Comment No. 9, hearings section, and Letter No. 35, Comment No. 6.

(24) Comment: Some additional large problems are not addressed in the draft EIS in depth. (Climatic changes, damage incurred from breathing poor quality air, biological changes in plants in areas affected by the emissions, and the problems of washout are not discussed in the draft EIS.) The document repeatedly claims, perhaps mistakenly, the emissions controls will meet current regulations and no additional action need be anticipated to deal with trace element contamination.

Response: See response to Spence's Comment No. 1, hearings section.

(25) Comment: The solid disposal from the project would include bottom ash, fly ash, scrubber sludge and other wastes. These materials contain concentrations of trace elements far higher than those found naturally in soils. The draft EIS (III 112-123) states that leaching of the ash disposal into Lake Powell would occur as rain moves down through the disposal material to a mudstone shelf which would induce lateral movement of the salty, trace element contaminated water to seep out of canyon walls. Estimates of the quantity of contamination are not thorough.

Response: The estimates of the quantity of contamination as presented in the Final EIS represent the best available information and projections within the present state of the art.

(26) Comment: The tailings would contain concentrations of certain trace elements in excess of natural conditions by a difference of several hundred fold. Arsenic, fluorine, boron, nickel, and chromium are mentioned in the draft EIS; however, lead, cadmium, beryllium, and most of the other trace elements in coal would also be in the tailings. The fate of these elements is ambiguous. Some amount would be absorbed by fine grained shale and mudstone while the remaining portion would eventually enter water systems.

Response: The amount of the trace elements that would be absorbed by the fine grained shale and mudstone is not known at this time. The amount absorbed and the amount entering the water system can only be determined by water monitoring before and after the power plant goes into operation.

(27) Comment: The draft EIS assumes current measurements of trace elements are adequate. Current measurements are inadequate and the effects on the entire ecosystem and ultimate effects on man must be integrated.

Response: The Draft EIS presented available data on trace element measurements. The Draft EIS also identified that lack of information prevented a complete evaluation of impacts associated with trace element emissions. Also, refer to response to Phillips' Comment No. 2, Atwood's comments and Crall's Comment No. 1, hearings section.

(28) Comment: Overall, the passive attitude of measuring trace element increases does nothing to prevent or solve the long-term cumulative problems. The draft EIS states that a problem is the long-term cumulative effects of trace elements carried by fly ash and deposited on soil, water and vegetation. However, the draft EIS apparently proposes that this be accepted. Fig. 19, (III-79) estimates the current soil trace element levels, pounds of trace element emitted, 35 year and 50 year cumulative effect. The treatment of these increases in trace elements is characteristic of the attitude exemplified by the following statement,

"Impacts are not fully predictable, but the toxic nature of some trace elements may be detrimental to future use of the area by plants and animals and, perhaps, man (III-78)."

Response: The Draft EIS attempts to predict the impacts that would occur if the proposed project were constructed. The EIS does not propose any action or problem be accepted or rejected; it is not a planning document. It is prepared for the information of the public and for decision makers. Also, refer to response to Phillips' Comment No. 2, Atwood's comments, and Crall's Comment No. 1, hearings section.

(29) Comment: Over-appropriation resulting from the project would specifically conflict with existing water rights. The 2,000 gallons of water per day needed for operation of the limestone quarry will come from already existing water rights in the Sevier River drainage (III-132). The preferred, anticipated water source for the new town would be ground water from deep wells. Withdrawal of the 5,900 acre-feet per year for the new town would lower existing water levels in existing nearby wells (III-117). There is no suggestion in the draft EIS that this water be taken from the proponents allocation from Lake Powell. While the existing water contracts may be a constraint, the alteration of them might prevent the possibility of long-term litigation eluded to on page III-128.

Response: Concur. Text was revised. The required 2,000 gpd for operation of the proposed limestone quarry may be obtained by purchase of an existing water right.

Diversion of water from the Navajo sandstone for the proposed new town would definitely require litigation. It is doubtful that the 9,690 af/yr (latest estimate) for the new town could be obtained by existing water rights. Application would have to be filed for diversion of this water and it is almost certain that the application would be protested.

(30) Comment: The Upper Colorado River basin agreements allocate Utah 1.714 million acre-feet (MAF) per year. This is based on an allocation of 7.5 MAF per year to the Upper Basin, a legal figure but apparently not a realistic one. A Department of Interior working figure for water in the Upper Basin, based on a series of assumptions, is 5.8 MAF. Utah's share would then be 1.322 MAF. The estimated 1974 depletions for the state total 825,000 AF. Under these conditions, Resources Inc.'s 102,000 AF represents about 20% of Utah's unused allocation. Engineering estimates predict that at most 50,000 AF will be used yearly.

This represents about 9% of Utah's unused allocations. These figures present the magnitude of the water use decisions under consideration and differ greatly with those presented in the draft EIS.

Response: Concur. The EIS has been revised accordingly, based on the total estimated requirement of 50,000 acre-feet per year for the proposed project.

(31) Comment: An estimate of future water use in Utah based on an allocation of 1.322 MAF reveals that Utah will be using all its water shortly after 1990. Since water rights are transferrable property rights in Utah, it can be expected that high value users of water will bid rights away from low value users. Since the production of energy represents a dollar value of a much greater magnitude than agriculture in the region for a given quantity of water, it seems reasonable that in the absence of institutional constraints, water use will be bid away from agriculture into energy use. The Department of the Interior stated on April 24, 1975, that energy will not be given priority for water use over agriculture. Furthermore, Article III, Paragraph (e) of the Colorado River Compact states that agricultural and domestic uses of water shall have preference over use for power generation. This does not seem to be the policy which is developing. Power plant development is getting preference over all other uses.

The implications of this are staggering. Not only does the consumptive use of water for power production prohibit agricultural uses, the impacts of increased energy supplies have grave ramifications for agricultural lands in the market area.

Response: The State of Utah determines priority use for their allocation of Colorado River water. In this instance, the State Engineer, under a water service contract, has granted water for energy use.

(32) Comment: Within the realm of energy production itself, it is not clear that the burning of coal to produce electricity represents the most efficient use of a given amount of water. The use of water for Kaiparowits may preempt the application of more desirable energy technologies, clearly a cost that must be given a greater consideration in the draft EIS. In this age of perpetual energy crisis, resource use decisions should be made with respect to efficiency criteria.

Response: A discussion comparing this and other uses of available water is given in Chapter VI of the Draft EIS. The discussion on Alternatives (Chapter VIII) of the Final EIS has been expanded to show how much water would be needed to provide equivalent amounts of energy in other ways.

(33) Comment: Water quality is a major problem in the Colorado River. Increasing salinity not only affects the productivity of water in certain uses, but also has a bearing on treaty obligations with Mexico. Although the issue of Kaiparowit's effect on salinity appears to be unresolved in the draft EIS, it seems certain that over the lifetime of the project, water quality will be detrimentally affected. As is stated in the draft EIS, "with the proliferation of energy producing, water using projects, the cumulative effect ... on water quality could significantly affect the long-term productivity of the region and those distant areas served by the Colorado River." The Bureau of Reclamation

recently estimated a downstream cost of \$230,000 per MG/l salinity increase. It is not clear in the draft EIS who will pay for these costs.

Response: The Colorado River Salinity Control Act of 1974 (PL 93-320) established the Colorado River Water Quality Improvement Program which would offset increases in salinity in the river while upper basin states continue to develop the allocated Colorado River water. The program would be financed by federal funds and revenue obtained from hydroelectric power generation. This is addressed in the Final EIS.

(34) Comment: The use of water for Kaiparowits and for energy development in general in an age of water shortage will divert water from essential uses that cannot be evaluated in terms of dollars but, nevertheless, must be provided for. The Interior Department recognizes high quality recreation, fish and wildlife, and open space values of the Upper Colorado Region as national assets that should be preserved and given special recognition in land and water use planning. Since the Interior Department has yet to quantify such water requirements, decisions on energy development should recognize the diversion of water away from these and other uses as a result, however indirect, of those decisions to a greater extent than the draft EIS does. Wildlife, including endangered species must be provided for. Ecosystems, the ultimate earthbound energy production units, whose existence man depends on, need water for survival. Wild and scenic rivers need water if they are to be viable entities. Water must be provided for the sole purpose of maintenance of water quality. Moreover, the ultimate use of water to man in a world of vanishing "natural qualities" may be its free flowing attributes. These elusive aesthetic and psychological values don't enter into present cost benefit analyses or into the draft EIS.

Response: The State of Utah should establish priorities for alternative uses of water, and it has been a long-standing policy of the Department of

the Interior to honor the priorities and wishes of the state in which projects are located (VIII-375 of the Draft EIS). Presumably all alternatives including aesthetics are considered when priorities are set.

(35) Comment: The draft EIS correctly recognizes the intimacy which ground water has with other parts of the environment, notably surface water. It states, "because of the close relationship between ground water and surface water . . . any adverse impact on one would eventually affect the other." (III-110) However, it seems that these collective impacts cannot be evaluated due to a lack of ground water data. For example, "movement from water yielding areas to Lake Powell is very complex and, because of the scarcity of data, poorly understood (III-110)."

Response: Concur. A water-quality monitoring program has been designed and implemented to help fill these data gaps. Hopefully, there will be several years of base-line data from this program before the projected start-up date of the proposed project.

(36) Comment: In addition to these large gaps of knowledge, there seems to be several contradictions in the various ground water sections of the draft EIS. Page III-114 states, "information about the location, extent, and hydrologic properties of the perched aquifers, and the quality of water in them, is too meager to predict impacts on particular springs or to accurately evaluate them." This would seem to contradict information found on V-26, "Coal mining activities associated with the proposed project would disrupt perched aquifers discharge an estimated 160-acre-feet of water per year to seeps and springs . . . in Warm and Last Chance Creeks." This kind of information should be available in the EIS for all ground water areas which may be affected by the project.

Response: The complete analysis (completed on page III-115) is consistent with the conclusion on page V-26. It is estimated that total discharge from

the perched aquifer is 160 af/yr. It can reasonably be assumed that part of this discharge would be depleted; what cannot be predicted is which specific spring or springs would be depleted.

(37) Comment: Comments, such as, "the participants state the proposed (limestone) quarry would not be deep enough to intersect the local ground water table" (III-132) are misleading. This is especially so since the next sentence of the same page states, "however, depth or seasonal range in depth of the local ground water table in this area are not accurately known."

Response: The basis for this statement is to question the apparent conclusion by the participants that because core holes did not penetrate ground water, neither would the quarry. The statement made on page III-132 is to qualify that conclusion.

(38) Comment: The unavoidable adverse impacts listed on V-53 only begin to quantify the problems which would result from implementation of the object. Such treatment does not take into account the unquantifiable environmental amenities which should be given the "appropriate consideration" as defined by NEPA.

Response: To give an adequate response to this comment one would have to know more precisely what the author means by "unquantifiable environmental amenities". Most of the items listed in Chapter V - Recreation, are unquantifiable or at least, very difficult to quantify. Chapter V has been expanded in the Final Statement and, to the extent possible, all significant foreseeable unavoidable impacts whether or not they are quantifiable are included.

(39) Comment: The aesthetic impact evaluation on III-205-206 seems to arbitrarily classify visual intrusions which would be imposed by the generating station facilities. The "low" rating given for the Rainbow Point Overlook, Bryce Canyon National Park, is an incredible understatement. How can the visual

aesthetic impacts be anything but severe from all the major overlooks listed on III-205-206? The monolithic plant would constitute a grotesque eye-sore upon the natural landscape. A point not raised in the aesthetic impact evaluation is that 4-Mile Bench is visible from all major overlooks in Bryce Canyon National Park.

Response: In our judgement, the low rating is valid because it measures the relative visual impact of the physical facilities at the plant site, not the visual impact of the stack emissions. At a distance of 32 miles, the plant complex would blend into the gray background of Smoky Mountain and Fiftymile Mountain.

(40) Comment: Mercury from Kaiparowits entering the Lake Powell ecosystem would almost certainly further aggravate the problem of mercury concentration in the fish of the reservoir. The draft EIS states, "fish most prized by the angler are the ones most likely to accumulate mercury levels unsafe for human consumption (III-154)." How will this affect the existing fishing resources of the reservoir, and the expected 15,000 additional man-days of fishing which the project is expected to cause? The answer is given in the draft that fish of lower trophic levels, such as blue-gills, would be substituted for the large game fish, does not take into account that people may not want to make the switch.

Response: Concur. The text has been revised. The "fishing resource" would be adversely affected by the accumulation of mercury in the large predator fish above the 500 ppb level which is the upper limit recommended by the Food and Drug Administration for human consumption. This would result in a loss of fisherman days or reduction in the quality of the recreation experience or a combination of both. Lake Powell, at its present level of productivity, could absorb the increased fisherman use (15,000 man days) without undue loss of quality. Fishermen would likely not want to switch from large to smaller game fish. Thus, the loss of fishing quality becomes a factor.

(41) Comment: According to the draft EIS only a 10% survey has been completed in the impact area to determine potentially significant cultural resources (II-246). For the transmission impact area, "the number, kinds, and significance of sites that would be affected and the severity of impacts to them are unknown (V-51)." According to Executive Order 11593, Sections (2) (a) and (2) (b), no action could be taken in regard to Kaiparowits unless these missing data were quantified. Informed decision-making necessitates that the final EIS contain a complete reconnaissance of the proposed generating plant site, mine site, new town site, new highway, limestone quarry, access roads, water pipeline, pump stations, transmission lines, and any other ground disturbed areas in order to determine if any archeological remains are possible for inclusion in the National Register of Historic Places.

Response: When the transmission line routing has been identified, a complete survey will be required. See Item 32, Chapter IV, BLM Bonding Requirements of the Final EIS.

Please refer to the Memorandum of Agreement developed between the Advisory Council on Historic Preservation and the Bureau of Land Management found in Chapter IX, Consultation and Coordination. Outlined are procedures which will be adhered to for proper consideration of all cultural values.

(42) Comment: The final EIS should also contain the Memorandum of Agreement between the Advisors Council on Historic Preservation, the Utah State Historic Preservation Officer, and the proponents pursuant to 36 CFR 800.5 (g).

Response: Refer to Chapter IX, Consultation and Coordination, for comments of the Utah State Historic Preservation officer and the Memorandum of Agreement developed between the Bureau of Land Management and the Advisory Council on Historic Preservation.

(43) Comment: For example, the Perry Mesa Area, which contains a large concentration of Indian ruins, has already been nominated for inclusion in the National Register. This area will be affected by the Kaiparowits to Phoenix transmission system. Although the draft EIS lists known cultural resources of National Register quality, it does not make adequate allowances in its plan for discoveries of other areas equally suitable for inclusion.

Response: In Chapter IV, Items 32 through 40, BLM Bonding Requirements, cover methods that would be required of the right-of-way grantee to identify and prevent damage to presently unknown areas of National Register quality.

(44) Comment: The mitigating measures proposed by the participants are vague at best. "Potential effects and the degree of success of these measures cannot be evaluated (IV-41)." Nowhere in the draft EIS is there an outline of the proposed techniques to be used in minimizing adverse impacts.

Response: In this case, participant mitigating measures would be overshadowed by the more comprehensive federal mitigating measures. Therefore, the participants would have to abide by the stricter federal measures.

(45) Comment: Court cases such as Sierra Club v. Froehlke, (U.S. District Court, Southern District of Texas, Houston Division-No. 71-11-983) and Warm Springs Task Force, et al. v. Lt. General William C. Gribble Jr., et al., (Supreme Court No. A-1146) have emphasized the need for adequate archeological surveys to be completed on certain lands to be developed. The draft EIS has not given such surveys the appropriate considerations they deserve.

Response: See response to previous Comment No. 42.

(46) Comment: The draft EIS states, "unless proper control is maintained, Kane County could experience a disproportionate crime rate and other problems similar to those experienced in Campbell County, Wyoming, where boom town

conditions caused a dramatic rise in problems." These problems are indicated to include divorces, arrests, public drunkenness, driving while intoxicated, and school dropouts. Just what constitutes "proper control" is not explicitly explained. Mitigating measures applicable to boom town growth may well be non-existent.

Response: The Kaiparowits Planning and Development Advisory Council is concerned that proper controls be developed prior to the possible inception of the project to prevent these social problems.

(47) Comment: The draft EIS does not provide an adequate analysis of the current social structure of the region nor completely evaluate the impact the project will have upon current residents. The communities of southern Utah to be directly affected deserve to receive complete information regarding the proposed alterations to their existing life-style and social structure.

Response: The text of Chapter III, Socioeconomic section, particularly the section on the plateau and quarry impact areas, has been modified to discuss these points from a sociological point of view.

(48) Comment: The draft EIS presents commendable treatment of the initial impacts the project will have upon wildlife populations. However, long-term and cumulative adverse effects upon these wildlife species also demand adequate treatment.

The document omits a number of important considerations in evaluating the ultimate effect of the project upon existing wildlife. The aspects of tolerance levels, population stability, migration patterns, habitat requirements, limiting factors, and ecological interrelationships of the affected species are given too brief a treatment.

Response: Concur. Text has been expanded.

(49) Comment: The extent of initial vegetational loss is amply defined in the statement. However, certain sections warrant further consideration.

Four Mile Bench supports an especially important stand of ancient pinyon and juniper trees. Appropriate alternative uses of the area which would include proposing protection of this unique natural community are warranted.

The cumulative impacts of 5800 tons of salt dispersed from the project's cooling towers are not well defined. These salts would steadily accumulate during the lifetime of the project and have chronic effects upon affected plant species. Combined with the fly ash, toxic trace elements, SO_2 and NO_x emissions from the plant, a large area could suffer denudation. Streams, seeps and ground water supplies would become polluted by these wastes to an undefined degree. The undetermined effects of these pollutants upon the environment threaten agricultural productivity of a large region as well as aquatic life in Lake Powell reservoir.

Response: Alternative power plant sites are discussed in Chapter VIII. Also, see response to McComb's Comment No. 2, Salt Lake hearings. The effect of salt drift is discussed in the Soils and Vegetation sections of Chapter III and Appendix III-6 of the Draft EIS. The effects of SO_2 and NO_x are discussed in the Air Quality and Vegetation sections of Chapter III. Pollution to water is discussed in the Water Quality section of the same chapter.

(50) Comment: The environmental impacts imposed by the Kaiparowits project would contradict the intent of the Wilderness Act which sets aside these areas to remain in an untrammelled state.

The draft EIS should provide a more thorough evaluation of the project upon the regions wilderness resources.

Response: Refer to Chapter III, Recreation, Transmission System Impact Area, Natural Values and Primitive-wilderness Values. Specific areas with natural, primitive, or wilderness values along the proposed transmission system are

identified in Chapter II. The potential impacts the proposed transmission system would have on these areas are identified. Although some alternate lines cross such areas, other alternates are routed so as to miss them. Using this information, decision-makers should be able to select a suitable route.

(51) Comment: The principal pollution hazard from the transmission lines is the production of ozone by corona discharge. The draft EIS states "ozone production impact would be insignificant along this entire route (II-16)." However, the cumulative effects of ozone produced by the transmission system are not outlined to support this finding. In addition, the contribution the transmission system will make to a global increase in ozone concentration is not mentioned. These considerations are important considering the health and biological hazards posed by ozone.

Response: All the studies on ozone effects from transmission lines which we have used in preparation of the EIS show these effects to be so minimal as to be inconsequential. This would include present existing lines plus up to two-500 kV ac lines from the Kaiparowits power plant.

Concerning the global increase in ozone concentration, there is considerable concern regarding an upper atmosphere decrease in the existing natural ozone layer and this is being sampled. Refer to the EIS for the Watts Bar Nuclear Plant, Nov. 9, 1972 - Tennessee Valley Authority.

(52) Comment: The modification of topography, visual intrusions, and disruption of ecosystems along the proposed transmission routes deserve additional evaluation. This transmission system must be considered in relation with other such proposals. Considering current proposals, there could be eight to ten transmission lines in the Kaiparowits-Eldorado corridor. This prospect again emphasizes the need for a regional EIS.

Response: See response to Rudolph's Comment No. 7 and Janke's Comment No. 2, hearings section.

114. Environmental Defense Fund

(1) Comment: The Kaiparowits EIS represents the piecemeal assessment of the environmental impact of energy development in southern Utah. Since other coal-fired electric generating facilities requiring federal actions are being proposed within the Colorado Plateau Region, environmental impacts are regional synergetic and cumulative. The Kaiparowits EIS cannot, indeed does not claim to adequately assess these types of impacts. A regional EIS appears to be mandatory in order to satisfy the spirit and intent of NEPA.

Response: See responses to Rudolph's Comment No. 7 and Janke's Comment No. 2, Hearings comments section.

(2) Comment: The draft EIS does not discuss the presence of protected, rare or endangered plant species on any of the proposed plant and town sites (II-3, 4; 157-61). However, the possible identities of various protected, rare or endangered species along each of the proposed transmission line routes is fully discussed (III-147-8). Apparently, the plant and town sites have not received as intensive study of protected, rare and endangered species as have the transmission corridors. Since vegetative impacts will be much greater at the plant and town sites, the EIS is inadequate in this regard until such studies are conducted and reported as part of an environmental report.

It is stated on p. III-139 that, "Unique vegetation would be disturbed on the Kaiparowits Plateau (very old pinyon and juniper trees) . . ." but the age of the trees is not given, even though it is further stated in the same paragraph that "Old pinyon and juniper trees have some scientific value and could not be replaced in hundreds of years." However, "One 1,400 year old tree has been

identified." (p. II-159). It is curious that a unique environmental situation such as this is described in such a nebulous manner.

Response: See response to Beard's Comment No. 2, hearings section.

(3) Comment: There is no reference to any probable socio-economic benefits or costs to citizens in other sections of Utah, such as the Wasatch Front (e.g., tax demand shifts, opportunity costs in the Wasatch Front resulting from extraordinary capital demands in the impact area).

Response: In terms of social system relationships, it can be assumed that ultimately the state would incur a cost from Kaiparowits (in addition to stated benefits). At this time it is not known what the statewide tax demand shifts and opportunity costs along the Wasatch Front may be as a result of Kaiparowits development.

(4) Comment: What are the impacts upon local government as contrasted to those for state government? Are there significant differences between Montana and Wyoming and the situation in southern Utah? Is the Kane and Garfield county situation unique and in what manner? The EIS seems to either avoid or omit discussion of any of these topics.

Response: The Kane and Garfield County situation is unique in that it encompasses a rural area and the residents are predominantly of a single cultural scarcity is also a factor. Refer to Chapter III, Socioeconomic section, which was revised, particularly the subsections on plateau and quarry impact areas.

(5) Comment: The alleged financial gain, supposedly to accrue to the more populated areas of Utah as a result of the Kaiparowits development, is not described in sufficient detail (p. III-268-9). The EIS should discuss the local costs (impacts) for new schools, law enforcement, sewage treatment, water and sewer lines and new gas and electrical lines, especially in the long-term beyond

the peak employment periods. The EIS simply reports that a majority of the southern Utah residents do not want the project if it "causes local taxes to rise substantially" (p. A-582). Without discussing whether there is any relevancy or utility of including such a poll as a truly valuable contribution to the statement (which is highly questionable), the fact that it appears requires some comment. It also reports that 73% of those individuals polled in southern Utah said that they did not anticipate changing their employment if their community grew substantially (p. III-275, A-583). The implications of these responses and attitudes of residents in the impact area are not addressed.

Response: Concerning public opinion, see reponse to Swenson's Comment No. 1, hearings section. In the case of taxation for schools, sewage treatment facilities and law enforcement considerations, refer to the revised Socioeconomic section in Chapter I.

(6) Comment: Inaccuracies are found throughout the socio-economic sections of the draft EIS. For example, it is stated that "Major impacts would result from the rapid influx of some 14,000 individuals in a county of less than 5,000 in southern Utah and in Page, Arizona" (p. III-10, 11). However, the population for Kane County was estimated at 2,700 in 1973 and was 2,421 in 1970 (II-351). These errors are significant and they should be corrected. The population will more than double in Kane County in two years, whereas Gillette, Wyoming's population grew 121% in 10 years (A-575, 6). The present population of Kane County will be 371 percent greater by year 5 of the new town (II-35, III-255).

Response: The above referenced statement refers to the population in Kane County and in Page, Arizona. This section has been revised in the FES.

(7) Comment: Further, the draft EIS refers to public opinion polls (p. III-11) and yet the draft presents the results from only one poll (p. III-268-95, A-577-600). To what other polls does the EIS refer? The public opinion poll

which is reported states that 45% of the individuals in the total sample are retired (A-579). Does this mean that almost one-half of the population has left the labor force? Or, is the poll an inaccurate representation of the two counties? The environmental statement concludes that, "Many citizens and officials consider delays unnecessary and unwarranted." (p. III-11). This conclusion is not supported by the results of the public opinion poll. The EIS should supply evidence for this contention and the distinction between opinions of lay citizens and public officials should be drawn.

Response: See response to Swenson's Comment No. 1, hearings section.

(8) Comment: One other very major social impact which receives only cursory comment is what can be called "people impacts." Without trying to crystal ball these impacts, it should suffice to point out that this subject is almost ignored. (For example, how much additional money will have to be spent by the U.S. Forest Service to accommodate recreation demands on the Dixie Forest (if indeed such money is available)?

Response: The text of Chapter III Socioeconomic section has been revised.

(9) Comment: This appears to be the most inadequate section of the EIS. A voluminous amount of data is presented for various mine, plant sites and transmission line corridor alternatives. However, there is no serious discussion of any basic alternate generating station sites outside of Utah (III-7), or within Utah outside the Kaiparowits area. A Rand study published in September 1972, entitled, California Electricity Quandry (3 vols.) locates potential generating station sites within California from which emissions would not violate present California air quality standards. Obviously, California siting is a major alternative, yet the EIS devotes approximately six sentences to this alternative. The

FEA study is appended without discussion (A-69). The serious lack of consideration of alternative sites is clearly another shortcoming which should be a part of the aforementioned regional EIS.

Response: The section on alternatives has been expanded in the Final EIS. The Rand study sets forth eight potential sites in California for nuclear and oil/gas power plants. It does not consider coal-fired plants. The Rand study (Rand Corporation, California's Electricity Quandary: I. Estimating Future Demand, September, 1972) was considered in preparation of the Final EIS.

(10) Comment: The majority of the energy conservation measures which might result from an application of technology are available now. The applications mentioned have been incorporated into the daily operations and working philosophies of the federal government and many industrial concerns throughout the U.S. The application of these energy conservation measures (p. VIII-357-9) should be related to electric generating plants, rather than nuclear plants.

Response: The section on alternatives (energy conservation measures) has been expanded in the Final EIS. Also see response to Cole's Comment No. 4, hearings section.

(11) Comment: Attention is given to a capacity greater than 3,000 megawatts at the Kaiparowits site (VIII-21). Is this an alternative or is it a basic proposal that is presently being considered? The EIS (VIII-21) states that "participants would be receptive" to a secretarial implementation of increased capacity. There is no discussion of a smaller size generating facility at the Kaiparowits site or elsewhere. This is an important alternative, since there is presently 18.6% of the venture unaccounted for.

Response: The participants propose to build four 750 MW units or a total of 3,000 MW at the Kaiparowits site. The participants would have the

discretion to build and operate up to four units since impacts for that number have been assessed. They also may buy or sell power as they wish. The discussion in the DEIS on VIII-21 is an alternative to the proposal.

(12) Comment: Details of the recent California Public Utility Commission decision should be presented. The need for Southern California Edison and San Diego Gas & Electric Companies to make up 7.7 and 23.4% of their projected peak megawatt demand by 1982 with Kaiparowits (p. I-15) should be reduced. The projections used by SDG&E and SCE are based on 1973 recorded peak demand and energy requirements. A decrease in California's electric consumption took place in 1974. Since a lower demand projection for California is apparently realistic, a situation of lower demand should be fully discussed as an alternative to the proposed action.

Response: See response to Rudolph's Comment No. 6, hearings section. The alternative of less than a 3,000 MW plant was not discussed in Chapter VIII. However, we could determine the effects of such an alternative by subtracting from the impacts of the 3,000 MW plant. For example, the impacts from a three-unit plant (2,250 MW) would be somewhat less than 3,000 MWs.

(13) Comment: According to the EIS, visibility in the Kaiparowits region is presently 70 miles under average conditions. Background data suggest that average visibility prior to the Navajo plant was 90 miles and that background levels of various air pollutants "are at or below limits of detection of the monitoring units" (p. II-1). Maximum visual ranges of 155 miles are reported for the region.

The statement notes that important studies of air quality are in process but the results are not available and thus cannot be used in assessing impacts upon air quality. In general, the EIS displays air quality data but does not discuss their implications for environmental quality.

Response: Please see our responses to Williams' Comment No. 1 and Scott's comments, presented in the hearings section.

(14) Comment: The major aspects of air quality impacts are not discussed. Is the 155 mile visual range condition unique to the remainder of the United States? What is the effect of air pollution upon aesthetic conditions other than visibility such as air coloration? What is the relationship of air quality to the existing aesthetic amenities of the area such as the nearby national parks? What impact will the Kaiparowits plant have on this relationship? The EIS briefly states available measurements indicate that the area's air quality is "generally excellent."

Response: See Chapter III in the Final Statement for impacts on visibility and aesthetics.

(15) Comment: An errata sheet devotes two paragraphs to the EPA limitations for significant deterioration and states that the "probability exists that the plume from the proposed project would violate the class I limitations." The EIS states that the implications for air quality of a class I designation will be discussed in the final EIS only if the areas are so designated prior to the date of publication of the final document. Since the authors of the EIS have been aware of the EPA limitations for at least 18 months prior to the issuance of the draft EIS, there is no reason that this potential situation be relegated to a discussion of four sentences in an errata sheet to Volume I of the draft EIS. This is a major deficiency of the draft statement. The environmental impact of the Kaiparowits project upon a class I air quality area should receive thorough scrutiny and evaluation for it is this impact that is viewed by many as the priority concern.

Response: The areas in question have not been designated but are presently under study by the National Park Service. The statement on the errata

sheet has been incorporated into the Final Statement. The discussion on class I designation has been expanded also.

(16) Comment: The basic thrust of the evaluation of air quality impacts is misdirected and does not analyze the important questions of air quality and its effects on other values, especially land use values in the region. The analysis that is presented is replete with inconsistencies, omissions and errors. For example, 12 tons of flyash, 250 tons of nitrogen oxides and 34 tons of sulfur dioxide will be emitted daily from the facility's stacks if the air pollution control equipment is operated at design levels. There is presently no operational and proven scrubber for removal of particulates of a plant of 3,000 megawatts. The Mojave plant equipment functions for a plant of one-half the projected size of Kaiparowits. Such assumptions of high level reliability are very suspect and require qualification.

Response: See response to Spence's Comment No. 1, hearings section.

(17) Comment: The proposed plant sites are visible from 6 easterly facing overlooks, including Rainbow Point overlook (9,105 ft.) in Bryce Canyon National Park. It seems that areas approximately 16-24 miles away in a region where normal visibility is 70 miles and often as much as 155 miles the visual impact of the Kaiparowits plant is one of high vulnerability rather than low as stated in the EIS (III-203).

Response: The intent of this comment is unclear as the terms of low and high vulnerability are somewhat subjective and have different connotations to different individuals. High and low visual vulnerability is defined in Chapter III of the DES and FES.

(18) Comment: Further, it is stated that "A study (Bechtel Power Corporation, 1974) sponsored by the participant indicates that reduction of visibility

of this magnitude (i.e., 10-20 miles) would occur infrequently" (p. III-207). In addition, it has been said of the Nipple Bench site in 1971 that "during the winter low level surface inversions were common, often strong enough to maintain themselves throughout the day" (p. II-49). These statements are in conflict. Atmospheric dispersal seems to vary seasonally.

Response: See response to Williams' Comment No. 1, hearings section.

(19) Comment: Inconsistency of the statements in the DEIS related to trace elements and their health effects are evident. In one place (p. III-35) it is claimed: "Based on a comparison of measured background levels of trace elements at Page and predicted ambient air concentrations using conservative assumptions, trace-element emissions are not expected to have a significant impact on health." However, it also appears in the statement (p. V-1): "Small amounts of trace elements, noise and engine emissions would be released and accumulated over the life of the plant and these have potential for adverse impact."

Response: Text has been revised. Trace elements have the potential for adverse impacts but these impacts are not anticipated to be significant. See responses to Crall's Comment No. 1, hearings section, and Letter No. 79, Comment No. 5.

(20) Comment: The EIS neglects to address the impact of deep well withdrawal of ground water for the proposed new town and the resulting depletion of ground water resources in this area as well as the Indian water rights. Also not dealt with are the effects of withdrawal of surface water from Lake Powell on ground water recharge. The combined effect of these two activities could have drastic impact.

Response: The potential impact of withdrawing ground water for the proposed new town was discussed on pages III-116 and III-117 of the Draft EIS. This discussion has been modified in the Final Statement.

Bank storage around Lake Powell could be considered as an artificial form of ground water recharge, but with Colorado River water. The potential impact of withdrawing ground water near Lake Powell could be a legal impact; this is addressed on page III-118 of the Draft EIS and has been included in the Final Statement.

(21) Comment: It is not clear from the EIS whether the ground water for the new town is part of the allocated water from the Colorado River Basin.

Response: This has been expanded in Chapter III of the Final EIS.

(22) Comment: Discussion of increased salinity in the Colorado River is confined to the effects of water withdrawal with no adequate analysis of salt content in surface runoff from salt deposition over more than 930 acres and from salt drift from the cooling towers.

Response: This potential impact is addressed on page III-123 of the Draft EIS and is discussed in the same section of the Final Statement.

(23) Comment: The evaluation of alternatives should include alternative uses of water. Utah is responsible for allocation of its share of water in the Upper Colorado River Basin throughout those portions of the state related to the Colorado River drainage. As a result of the responsibility and restrictions of the Colorado Basin Compact, when Utah, in the use of its waters under the Compact, makes a commitment for the use of 102,000 acre-feet of water on Kaiparowits Plateau out of Lake Powell, such action forecloses the use of the same amount of water at some other point in the state on a river or stream that is part of the Colorado River drainage.

All alternatives must first be specified as either viable or not within existing and future constraints on such use. The basic time constraint is the commitment period of the Colorado River agreement. It is during this time

that there is the direct foreclosure of alternative uses of that water. Beyond this basic time frame the EIS should consider the secondary alternative foreclosures caused by institutional limitations during the agreement time. Are there future alternative water use demands occurring late in the agreement time period which would require commitment beyond that period but which the Kaiparowits allocation would foreclose any potential for allocating water to that use? Although a basic geographic constraint is the Colorado Basin within Utah, distribution of the allocated Colorado River water can occur legally anywhere in the basin. In the future, capabilities to export unused water from the basin must be considered as an extension of this geographical limit.

The alternative of water use for energy development must address the question to what type of energy development should the water be committed. This question of energy development type must be addressed in a way that the ultimate yield of usable net energy is highest within other constraints of economics and the environment. The lack of consideration of such alternatives in the EIS reflects upon the adequacy of the entire EIS.

Response: See response to Letter No. 102, Comment No. 5.

(24) Comment: There are socio-economic and environmental limitations which further refine potential alternative uses. Within the Colorado Basin, there are specific economic conditions forcing consideration of water use into fairly limited areas. Availability of access, infrastructure, and market are all keys to this identification, in addition to the physical limitations. The EIS should consider important environmental limitations such as the location of national parks and monuments, potential wildland, scenic rivers, other aesthetic in situ uses, rare and endangered species habitat, and other critical wildlife habitat.

Response: These subjects were discussed in Chapter III of the Draft EIS under sections entitled Recreational Resources, Wildlife and Ecological Interrelationships.

(25) Comment: Under this directive, the Council has developed the basic criteria for environmental quality evaluations. These criteria should be addressed in the Kaiparowits EIS. The council defines environmental quality as the " . . . enhancement by management, conservation, creation, restoration or improvement of the quality of certain natural and cultural resources and ecological systems in the area under study and elsewhere in the Nation."

Response: Refer to response to Letter No. 102, Comment No. 17.

115. Timothy E. Wirth

(1) Comment: The subject area in which the draft is most sadly deficient, unfortunately, is the threshold issue of the need for such a massive power project. What information is provided is admitted to be almost entirely the product of "an analysis by each participant of its need for power from the Kaiparowits project." DES, volume I, p. 15. The Federal Energy Administration review of the participants' analyses noted the lack of other sources of data:

Independent predictions of future demand would be useful in assessments of the need for new generating facilities. But no such comprehensive projections have been made for the Kaiparowits market area. Those projections which have been made are either lacking sufficient detail or rest on assumptions considered too speculative as a basis for planning.

Response: Refer to response to Rudolph's Comment No. 6, hearings section.

(2) Comment: A comprehensive, independent evaluation of the necessity for the project would be more than just "useful"; it should be an imperative. The Bureau would be negligent if it were to permit the construction, on federal land, of such an enormous plant without first having an unbiased determination of the need for it. Both common sense and the National Environmental Policy Act require nothing less.

The need for such an independent evaluation is all the greater because the data supplied by the participating utilities do not reflect the increasing national emphasis on energy conservation. The combined calculations by the four companies of their total energy requirements show an increase of over 100% between the measured 1973 levels and the projected 1985 levels. DES, volume I, figures 2, 7, 12, 15. Likewise, their combined calculations of per capita consumption show an increase of over 80% between 1973 and 1985. DES, volume I, figures 4, 9, 11, 17. These projections differ little from historical patterns, but we are no longer in a time when those trends can or will continue. As we continue to move beyond our previous practice of unthinking energy consumption, the figures used to justify the project will likely become more and more overstated.

Response: Refer to response to Rudolph's Comment No. 6, hearings section.

(3) Comment: In short, the draft statement does not provide adequate information for a determination of the need for Kaiparowits. The final statement should include new data from the participating utilities that reflects, as much as possible, the change in our pattern of energy consumption. Also, that data should be independently evaluated from within the framework of a national energy policy. While this reassessment might mean a slight delay in the preparation of the final statement, the measures that have already been taken to conserve energy have been effective enough that the utilities and their consumers would not suffer from a relatively short delay.

Response: Refer to response to Rudolph's Comment No. 6, hearings section.

116. ISSUE?

(1) Comment: An even more attractive alternative would be the establishment of a diversified economic base in southern Utah. Coal mining has a history

of ups and downs, and may very well continue its cyclical pattern. An economy based solely on the mining of coal is susceptible to considerable difficulty; a mixed economy markedly less so. We can budget water supplies in such a way as to encourage the establishment of a diversified economy---we can do so by limiting the availability of water to energy extraction industries. An alternative use of water might be the establishment of controlled environment agriculture --- greenhouses. A study by the Western Interstate Commission on Higher Education (WICHE) shows that a 100 acre greenhouse would employ several hundred people, use only three or four hundred acre feet of water, and yield a highly profitable commodity. Given the attention being paid to national and international food supplies, such a proposition should not be dismissed lightly, nor should the alternative be foreclosed too quickly.

Response: This comment is rather vague. However, the consideration of a diversified economic base in southern Utah is not a reasonable alternative to the plant; therefore, it was not discussed in Chapter VIII.

(2) Comment: The coal gasification process is a closed cycle -- coal is heated in a retort and the volatile elements processed into coal gas. Ash and gaseous emissions are not vented into the atmosphere. On the other hand, huge amounts of ash and gaseous contaminants are released from a coal fired generating plant, and elaborate and expensive equipment is required to control the emissions. The Kaiparowits EIS notes that with the proposed pollution control equipment, the plume will not be visible unless observed along its centerline. The same statement was included in the EIS for the Navajo Plant -- and is false. The Navajo plume is on occasion quite visible -- enough so that a reporter from the Los Angeles Times can photograph the plume, and have the plume show up even through the newspaper printing process.

Which suggests that computer modeling of plume behavior leaves something to be desired. Long term visual observation of the Virgin River Canyon and the Arizona Strip indicates that power plants have a substantial effect on visibility even when operated with modern pollution control equipment. The Reed Gardner plant, located near Glendale, Nevada, was operated frequently without control equipment during 1974. The plume travelled nearly intact for distances in excess of one hundred miles, and had a substantial effect on visibility in Zion National Park. A general haze has developed over the Arizona Strip, almost certainly the result of operations at the Mohave Generating Plant south of Las Vegas. The Kaiparowits plant would be larger than those two put together, and presumably have more impact, even if operated with the best possible control equipment.

Response: See response to Spence's Comment No. 1, Hearings comment section.

(3) Comment: The Environmental Impact Statement is unsatisfactory in that it:

Does not provide sufficient information on the new town development. Senator Frank Moss proposes that the new town may "disrupt the rural way of life, bring new social values and problems to formerly homogeneous communities, force up prices of goods and services, bring speculation in land and housing and create a severe squeeze in the availability of personal credit needed to offset the upward rush in the cost of living." -- S.L. Tribune, 8-21-75.

Response: Additional information concerning the new town became available after the Draft Statement was written. This has been included in Chapter I of the Final Statement. Impacts are discussed in Chapter III, Draft and Final Statements, Socioeconomic sections.

(4) Comment: Some of the problems created by a very large influx of new workers and their families can be alleviated by proper planning and funding. The Call Engineering Company study is fine as far as it goes, i.e. how many houses are needed, what kind of streets, etc. But information is completely lacking on who will fund all of the community services. Presumably, until the town is incorporated, the burden will fall upon Kane County. How will Kane County handle the problem? Estimates in other areas indicate a capital investment for community services in the neighborhood of 20,000 to 25,000 dollars. A proper evaluation of a new town cannot be made until information is provided.

Response: Additional information has been made available by Kaiser Engineers and has been included in the section on the new town, Chapter I, of the Final Statement.

(5) Comment: The regional impact of many large power plants has not been sufficiently dealt with. Studies in New England show that acidic rains caused by fossil fuel combustion may be retarding plant growth by 15%. How many ppm of sulfur can we tolerate in the ambient air before we create a detectable impact on agriculture? How many power plants are advisable from an environmental standpoint? What is the rate of sulfate production from the sulfur oxides that are released? The EIS is deficient from this standpoint.

Response: See responses to Rudolph's Comment No. 7, Spence's Comments No. 1, 2 and 3, and Crall's Comment No. 1, hearings section.

(6) Comment: We cannot know precisely what assumptions were fed into the computer model, but by inference we would judge that each component of the plume is analysed separately. The EIS notes that sulfate conversion is dependent upon humidity, but apparently takes no account of humidity within the plume itself -- it mentions only ambient air humidity. We suggest that large amounts of water

vapor are necessarily present in the plume -- partly from combustion, and probably because the plume from the stack joins with the cooling tower plume. Another matter dealt with is the presence of carbon dioxide, nitrogen oxides, and a fairly high energy (heat) content within the plume. The oxides would seemingly tend to form an acidic environment, which coupled with a high high energy content, may provide more ideal conditions for the formation of sulfates than previously anticipated. We do know, from observations of the stuff in laboratory jars, that sulfates are visible, and we wonder if what we see is or is not sulfate.

Response: There is a conversion of SO_2 to sulfate within the plume and this activity influences visibility. Also, see responses to Williams' Comments No. 1 and 3, and Spence's Comment No. 3.

(7) Comment: The section on alternatives is incomplete. Coal gasification is mentioned as a possible alternative, but not much more than mentioned. What will the effect be on energy supply if this option is supported instead of the power plant? What effect on employment in Utah and in California? What will be the effect on energy prices (the cost per kilowatt hr. is not the only factor.) What are the comparative environmental side effects? What effects on aesthetics when the two are compared?

The FEA analysis on energy conservation proposals is interesting, but again incomplete. If conservation is less capital intensive and more labor intensive, why dismiss it as simply unattractive to utilities? What incentives would be needed to promote conservation? Who would do the work? How many jobs would be created? What would be the effect on energy prices, and therefore inflationary pressures?

Response: The sections on alternative uses of coal, and energy conservation measures have been expanded in Chapter VIII of the Final EIS.

117. Southwest Powerplant Information Center

(1) Comment: One of the most glaring omissions in this Impact Statement, and an omission which completely overlooks the dangerous quantities and qualities of contamination which will be emitted by this installation, is that related to the trapping of the particulate or ash. Uncombustible mineral matter makes up approximately ten percent of this coal. Added to this is the partially burned or unburned coal which is also discharged into the atmosphere. As noted by the U.S. Public Health Service publication "Atmospheric Emissions from Coal Combustion":

"Ideally the only particulate emission would be the mineral ash; however, 0.5 to 5.0 percent of the combustible content of the coal can also be emitted as particulate matter. Thus more particulate matter can be emitted than there is ash in the coal...Associated with the combustible content are the polynuclear hydrocarbons...There is much interest in these substances because of their carcinogenic (chemical cancer agent) properties."

Concerning how effectively power plants' control equipment filters out the carcinogens and smaller ash particles, the same publication states:

"There was little if any reduction in the polynuclear hydrocarbons after the effluent passed through control equipment. This seems to indicate that polynuclear hydrocarbons are found in particles of less than one micron in size and are not easily collectible."

Thus, with this fuel to be burned, up to fifteen percent of the coal can end up as particulate matter.

The figure given in this Impact Statement for particles to be produced by this installation per day range from 2440 to 2675 tons of flyash and 610 to 672 tons of bottom ash--or 3050 to 3347 tons of particulate matter per day (127 to 139 tons produced per hour).

So much more of the finer flyash is produced than the larger bottom ash because the coal is first ground to talcum powder consistency, then blown into the furnace, in contrast to older methods which produced much heavier ash particles.

How much of this enormous quantity of ashes will actually be trapped instead of being ejected into the atmosphere?

Here this Environmental Impact Statement--as it is in so many other aspects of pollution control--is totally deficient, just assuming without discussion or question figures, statements or assumptions made by the participants.

The language used to describe what the participants will do, and what they will install, gives both the drafters of this Statement and the participating utilities an easy release if the contamination produced by this gigantic facility is too dangerous and offensive.

In numerous places in the Statement the phrase is used, "The participants propose...to install equipment with design efficiency of 99.5%," or that as on page IV-7, "The project is proceeding on the basis that the following levels of emission control will be attainable." Never is any positive statement used such as the participants insure, or guarantee, 99.5% particulate control. The reason for this is abundantly clear to all familiar with what "design efficiency" really means.

Response: See responses to Spence's Comment No. 1 and Williams' Comment No. 1, hearings section.

(2) Comment: Again as with the particulates, nowhere in the Impact Statement is the 90% proposed figure for sulfur oxides discussed, debated or challenged--only fully accepted without hesitation. Whether any apparatus which may be installed can work at a reliability even remotely resembling 90% is highly doubtful. The only basis mentioned for any kind of sulfur oxide control at all is a "study" made with miniature equipment (pilot plant) at the Mohave plant. There is no

mention of any similar massive plant to the Kaiparowits, burning low sulfur coal, that has installed any such equipment and achieved the results "proposed" here. Such a system appears to be a first and thus the operating results at this time have to be nothing if not questionable and speculative. This especially in the light of past attempts and failures over many years to achieve workable and reliable gaseous sulfur treatment equipment.

Response: Please see our response to Spence's Comment No. 1, presented in the hearings section.

(3) Comment: Because there are no known control devices for nitrogen oxides, mention of this dangerous class of pollutants (one of the principal ingredients of photochemical smog) is given, but the most cursory consideration even compared to the omissions and misleading treatment given to the other two primary pollutants...

Here too in these plants, with the release of thousands of tons of nitrogen oxides weekly from each facility, is a prime example of man's technological success (at building huge furnaces and burning enormous amounts of coal) but next to total environmental failure.

How then will there be "31 percent control of nitrogen oxide emission," (p. III-2) reducing "unabated NO₂ emissions from 15.4 tons per hour or 94,174 tons per year to 10.40 tons per hour or 63,598 tons per year" (p.IV-8)?...

No explanation is given anywhere in this Statement for how the boilers will miraculously produce only two-thirds of what they normally would--5 tons less an hour (120 tons less of nitrogen oxides per day)...

Even though neither here nor anywhere else in this verbose document is there any indication given of how dangerous and poisonous the nitrogen and sulfur oxides are, some hint is given of the visible atmospheric contamination that will accompany this immense coal burning....

The study referred to here just happened to be made by a division of Bechtel Corp., the builders of the installation at Page and also of the proposed Kaiparowits. Would any other conclusion be expected from an organization which builds power plants? Are these unbiased, objective, impartial "studies" made by a neutral observer?

A paragraph on page V-14 gives some idea of how misleading these power plant participants and their so-called consultants can be in spite of an abundance of visible and other evidence (of present day plants) contrary to their contentions. Here also the particular writer has attempted to restore some reality to the harmless picture painted by the participants and their hired operatives.

Response: See responses to Spence's Comments No. 1, and 3 and Williams Comment No. 1, hearings section.

(4) Comment: This Environmental Impact Statement as it concerns pollution control is replete with distortions and deceptions. The extent of the pollution and the danger associated with it are all downplayed. Highly important considerations are totally neglected--examples of which have been pointed out here. One wonders who was responsible for this completely unacceptable Statement of the environmental impact of this proposed action. The New York Times of Feb. 9, 1975, supplies the answer:

"Consideration of the long range impact of development is mostly given a lick and a promise, and in some instances, the bulk of the Environmental Impact Report data is furnished by the developer utilities themselves."

Response: Additional information on air quality was obtained from the Lake Powell Research Project, Environmental Protection Agency, and the Arizona Department of Health Service and incorporated in the Final statement.

(5) Comment: This EIS may have set a record for inadequacies, contradictions and self-confessed and other unknowns. Constantly in evidence are the

statements, "...the impact is not well defined...because of scarcity of data is poorly understood...a relationship can only be predicted with recognized uncertainties...predicting possible long term cumulative effects is difficult...there are presently insufficient data."

Response: Many unknowns still exist. The state of the art has not advanced enough to spell out impacts completely. See responses to Spence's Comment No. 1, Williams' Comment No. 1, Crall's Comment No. 1, Atwood's Comment, and Phillips' comments, in the hearings section and Letter No. 35, Comment No. 6.

(6) Comment: On page IV-7 in discussing "The participants proposal to reduce emissions from the generating station," five items are listed. The first has to do with burning low sulfur Kaiparowits Plateau coal. The third, fourth and fifth are concerned with devices--or non-devices--for the control of particulates, sulfur oxides, and nitrogen oxides respectively; that which has already been addressed here in detail. The second states: "Install stacks of a height that would provide the most efficient dispersion of flue gases."

Here again, another erroneous, totally false and misleading contention is made, giving the impression that tall smokestacks can reduce the emissions of this plant.

Response: It should be made clear that stack height has no bearing on the level of particulates, trace elements. etc. emitted into the atmosphere. Only pollution control devices such as electrostatic precipitators and ash-scrubbers can accomplish this. (However, stack height does lower impacts by wide dispersion.)

(7) Comment: On page III-11 the statement is made that "A small coalition of resident and non-resident conservationists would be disappointed if the project were approved." Its tragic and unbelievable how the authors of this Statement understate and downplay the effects of this, the largest coal burning plant yet conceived, and the tremendous opposition to it by large numbers of people. One

gets the impression that it would have to be utility company sympathizers or personnel on loan from these power firms who wrote this particular sentence. Has the writer of this paragraph ever attended any of the hearings on these operations such as the aforementioned ones conducted by the Senate?

Response: The text of Chapter III, Socioeconomic Section, has been modified to change this statement.

118. Steven J. Manning and Elna R. Manning

Comment: The environmental impact statement fails to include enough information about the specific effects of the pollutants upon the health of the people living within a specified radius of the plant. I recommend that the impact statement be amended to include more of the kind of information found in the above mentioned report. And that at the very least, a copy of the report be included in the impact statement.

Response: Concur. The text in Chapter III, Socioeconomic Section, particularly the subsection dealing with the impact of Kaiparowits power plants in the Kaiparowits Plateau and Quarry Impact areas has been revised to include additional information related to public health.

119. Tom Wright

(1) Comment: The EIS failed to fully consider the impacts of the project on the National Park System. 20% of the entire National Park System is located within a 200-mile radius of the plant site, and many of the major Parks nearby - such as Glen Canyon National Recreation Area, Bryce Canyon National Park, Zion National Park, Capitol Reef National Park, Canyonlands National Park, and Grand Canyon National Park - would be severely impacted.

Response: The Final Statement is expanded to give more emphasis to the visual air pollution impacts on Bryce Canyon National Park and Glen Canyon National

Recreation Area. To the extent that data was available the statement discusses and analyzes the possibility that parks such as Zion, Grand Canyon, and Capitol Reef could be impacted by visual air pollution. Emphasis was also given to impacts on marina facilities at Wahweap Marina.

(2) Comment: The single paragraph on page III-30 of the EIS dealing with air pollution in the Parks is totally inadequate, and the fact that the plant and its network of transmission lines will be fully visible from Bryce Canyon National Park was inadequately dealt with on page III-205. The EIS in general did a poor job of evaluating impacts on the Parks.

Response: See our response to previous comment.

(3) Comment: The section of the EIS on transmission lines was inadequate. The wording used to describe the proposed routes across the Arizona Strip was extremely confusing. What appears to be Southern California Edison's primary route across the Strip would have a number of serious impacts not adequately discussed in the EIS. For instance, it would pass very close to the Bureau of Land Management's new 35,000-acre Paiute Primitive Area in the Virgin Mountains, it would cut through an area where the Arizona State Game and Fish Department is trying to establish an antelope herd, and it would be a major intrusion on the grand vistas and pristine character of the Arizona Strip. Also on the subject of power lines, since many of the lines from Kaiparowits will parallel existing lines, the EIS should explore their cumulative impact on the landscape.

Response: The comments concerning the Paiute Primitive Area, the antelope herd, and the general natural values of the Arizona Strip are included in the Final EIS.

(4) Comment: On pages II-47 and II-49 the EIS points out that the area around the plant site is subject to lengthy inversions during the winter months. Yet this fact is ignored when the impacts of the plant on air quality are discussed in Volume III.

Response: New information has been obtained from the Environmental Protection Agency, Lake Powell Research Project, and the Arizona Public Health Service regarding air quality. This information has been reviewed and the pertinent data incorporated into Chapters III, V, VI and VIII of the Final Statement.

(5) Comment: The EIS is seriously inadequate in its discussion of the social and economic impacts of the plant. It does not deal adequately with the present life style of Southern Utah residents or with the drastic changes in that life style that are sure to follow if the plant is built. Quiet, well-ordered villages like Kanab, Tropic, and Cannonville will become dirty, noisy "boom towns" overnight. Housing, schools, and other facilities will be inadequate for the 15-20,000 expected new residents. The close-knit Mormon communities will be torn apart and overwhelmed by outsiders...people of different races, religions, and political inclinations. A way of life will be destroyed, forever. The EIS barely even touches on this.

Response: The text has been revised. Refer to the Socioeconomic Section, Kaiparowits Plateau Impact Area. However, some of the sociological literature regarding social and community change -both theoretical and empirical - is argumentive. The Kaiparowits Planning and Development Advisory Council and its consultants are planning housing, schooling, and other services for the expected new population.

(6) Comment: On pages III-11 and V-9, the EIS states that those who care about the beauty and solitude of southern Utah would be "bothered" or "disappointed" if the plant were built. I strongly object to the use of these words. They were obviously intended to belittle this point of view. to present it as silly and inconsequential. That the writers of the EIS would result to such tactics is a sad reflection on the quality of the EIS as a whole.

Response: Concur. The text has been revised.

(7) Comment: The EIS did not explore the need for the Kaiparowits project. A great deal of information on the "need" for power was supplied by the power companies, but according to page I-40 of the EIS: "Given the fact that utility demand forecasts are contested, independent projections of future demand would be useful in assessments of the need for new generating facilities. But no such comprehensive projections have been made for the Kaiparowits market area. Those projections which have been made are either lacking sufficient detail or rest on assumptions considered too speculative as a basis for planning." So, going strictly on their own projections and motivated by profit, the power companies are asking us to take their word for it that the project is, indeed, "needed". The EIS should carefully and independently evaluate the need for the project rather than merely printing up questionable figures supplied by the utilities themselves.

Response: Refer to response to Rudolph's Comment No. 6, hearing section.

(8) Comment: The EIS did not adequately discuss alternatives to the Kaiparowits project. The statement quickly dismisses alternate means of generating power (such as solar or geothermal) as impractical; energy conservation as a means of reducing demand is dealt with far too briefly on page VIII-36; and alternate sites for the plant outside of Utah are immediately rejected. All of these possibilities merit detailed consideration in the final EIS.

Response: The section on alternatives has been expanded in the Final EIS.

(9) Comment: The EIS considers only the Kaiparowits project, and if this was its original intention it is also a major fault. What is really needed is a comprehensive survey of the cumulative effects of the proposals to turn the

Colorado Plateau into an industrial center. For instance, in Southern Utah alone we have the proposals for Kaiparowits, for the Garfield plant near Escalante, for the Intermountain Power Project near Caineville, the Warner Valley project near St. George, and the Emery project near Huntington Canyon. Add to this the existing Navajo plant at Page and it is clear that a study of the overall situation is desperately needed.

Response: Refer to Rudolph's Comment No. 7 and Janke's Comment No. 2 in the Hearings comments section. To the extent that data was available, Chapter VI analyzes the cumulative impact of a possible interaction between Kaiparowits and Navajo.

120. Utah Environment Center

No response required.

121. Canyonlands Environmental Education Center

No response required.

122. Utah Commission for Ministry in Higher Education

Comment: These social and long range economic considerations should be plugged into environmental impact studies at the beginning and taken into account, with regional considerations as well as state considerations taken into the picture. The relatively short range economic factors are not enough. We recognize that the decisions are complex and that we in the Churches have a job to do as citizens and consumers and to the extent we are able as molders of values, but we believe part of our responsibility is to speak out now if we haven't before.

Response: The text of Chapters III and V, Socioeconomic Sections and summaries, have been revised to comment on long-range economic considerations.

123. Utah Association of Counties

No response required.

124. Federation of Western Outdoor Clubs

(1) Comment: The Federation questions the veracity of Figure 17 (page I-35) of the draft Environmental Impact Statement, (E.I.S.). The draft shows an increasing per capita consumption through 1973, a flat rate for 1974, a slight increase for 1975 and a flat rate for 1976 and 1977, then a sudden unexplained increase in per capita consumption beginning in January 1978 and extrapolated into the future.

Response: See response to Rudolph's Comment No. 6, hearings section.

(2) Comment: We can thus logically assume that the 1% decrease in the rate of increase was continuing for as long as 5 years. Thus the sudden jump beginning in 1978 (Fig. 15 & Fig. 17) is an extreme, unrealistic and unjustified aberration. The continuing drop in the rate after 1978 and to 1985 appears to be realistic. The error is the extreme aberrated basis of 1978.

Response: See response to Rudolph's Comment No. 6, hearings section.

(3) Comment: No one is quite so naive as to believe that any group of profit minded concerns is going to sink 2 billion dollars into a project and at the end of 35 years walk off and abandon the physical facilities. The E.I.S. make no assumption as to their disposal, continued use with fuel from a new or expanded use of the same deposits, where from and how the fuel will be transported, the additional impacts on other areas in the future, etc.

Response: In the case of impacts on soils, these have been carried out to 50 years. The 35 years discussed in the EIS refers to the amortization life of the project. The determination of impacts beyond 35 or 50 years is difficult at this time, and thus a water and air quality monitoring program would be implemented during the operation of the project.

(4) Comment: The E.I.S. but vaguely mentions possible continued recreational degradation of the 3,000 square miles of expected impact area around the total facilities. No indication is given as to the possible future length of operation of the plant, at what level, with coal from other available sources. How much? How long?

Response: At the present time, it is anticipated that the power plant would operate for at least 50 years. consuming 9 million tons of coal each year. All of this coal would come from the Kaiparowits Plateau. For recreational impacts, see Chapter III, Recreational Resources, which has been expanded in the FES.

(5) Comment: The EIS does admit to a probable subsidence of some 28 square miles of by 15 to 18 feet. Some disturbance or interruption of underground aquifers is anticipated, which will adversely affect the flow of wildlife sustaining water from springs and seeps. The possible length of this depletion is not dealt with.

Response: Concur. The text has been revised in Chapter III to the extent that percolating surface waters may become contaminated in passing through ruptured formations and mined out voids. Also, areas of possible influence of subsidence was revised upward to 63 square miles and the postulated degree of subsidence revised downward to 5 to 10 feet over most of the area.

(6) Comment: The mined out areas will be below the level of the surrounding surface and any faulting or rock cracking developed during the subsidence will cause water courses to discharge downward through such cracks into the mined out areas. The mined out areas will leave vast amounts of voids which will remain after subsidence. These voids will trap tremendous quantities of water and retain the water for a very long time before water levels and pressures will force it out at lower elevations or into other aquifers that terminate at some remote place. No mention is made of this real threat to wildlife sustaining water.

Response: Concur. The text has been revised in Chapter III to the extent that percolating waters may become contaminated and in turn may contaminate existing aquifers that still function and are not ruined by the subsidence.

(7) Comment: Also the water that is trapped and stands for long spans of time in the mined out areas will absorb contaminating substances that can very well make the water, if and when, it surfaces unusable or even dangerous to wildlife, and even to humans. This is a very real and dangerous consequence, that should be included in the E.I.S., if it is to be meaningful and fulfill its intended lawful meaning. There are many mine water outcroppings in other parts of the country to amply sustain this contention.

Response: The potential effect of the coal mining activity on groundwater quality is addressed on page III-15 of the Draft EIS and has been included in the Final Statement.

(8) Comment: in reference to transmission line locations, the argument is made that lines can not, or should not, closely parallel one another and should be placed on a new right-of-way at some distance from existing transmission lines. The argument appears to stem from an assertion that lines should be separated to reduce the risk from lightning strikes. No data is presented to support this claim. On the other hand, transmission line construction refutes the veracity of such claims.

Response: The participants proposed to construct lines with 2,000 foot separation where they parallel existing lines. This was evaluated. However, in Chapter VIII the line spacing alternate describes the impacts that would result if the proposed lines were constructed adjacent to existing lines.

125. Four Corners Wilderness Workshop

(1) Comment: Chapter I-13, New Town: Planning has been extremely inadequate

for other western projects especially in Wyoming. Some planning is mentioned briefly here but this should be one of the major impact considerations. What about initial effects of school establishment on taxation of local property.

Response: The text in Chapter III of the Final Statement has been revised to consider planning and associated impacts in greater detail. This is also revised in the summary.

(2) Comment: Chapter II-9, The statements concerning declining population in Page, Arizona, have now become erroneous. Per capita income should not be allowed to be confused with life quality which is quite high for rural residents.

Response: Concur. Information released by the Northern Arizona Council of Governments suggests that the population for Page has stabilized. You are also correct that per capita income should not be confused with quality of life. The necessary changes to the text have been made.

(3) Comment: It should be brought out that coal mining is a destructive activity. A resource is consumed which will not be available to future generations. Jobs which are created will eventually be eliminated and very serious social problems such as those in Appalachia are liable to arise. Wilderness and scenic values will be destroyed. Potential for other land uses will be seriously impaired or destroyed on subsidence areas.

Response: The irreversible consumption of coal has been discussed in the draft and revised even further in the Final Statement. It is expected that subsidence would probably not be visible to the naked eye and, therefore, would not destroy scenic values. Other values such as grazing would not be impaired.

(4) Comment: Chapter VIII. Alternatives. There has been questions raised if additional power is actually needed in the areas this development will serve. This evidently needs more study. An unmentioned alternative that might be a

"lesser of two evils" would be to construct the power plant adjacent to the one at Page and build additional power lines if necessary adjacent to existing lines to lower impact.

Response: The evaluation of the Federal Energy Administration, an expert in the field, that the load forecasts provided by the utilities were reasonable was accepted. However, due to a recent independent power demand forecast projection study, the text in the Final Statement has been revised. The Kaiparowits project is proposed for staged construction, one unit at a time until all four 750-MW units would be operating. Even if construction is approved, there is no guarantee that construction may not be delayed at the option of the proponents, and construction may indeed be delayed if the expected power demand does not materialize.

The section on alternatives in Chapter VIII has been expanded in the Final EIS.

126. Nancy Strong

No response required.

127. U.S. Dept. of Health, Education and Welfare

(1) Comment: We found the discussion of the feasible and viable alternatives to the proposed project to be inadequate. In no instance is there a comprehensive discussion of the relative health effects of the proposed alternatives. Also, the draft document states that "the alternative of using nuclear power is economically feasible, but scheduling of nuclear plants is uncertain at this time." It appears likely that the use of nuclear power as opposed to the coal fuel facilities would result in lesser environmental and health impacts. The health effects and long-term implications of the alternative "Delay and Denial" should also be discussed in greater depth in the final statement.

Response: A discussion of issues pertaining to health effects is found in Chapter VIII (Alternatives) of the Final Statement.

(2) Comment: What provisions have been made for providing an adequate water supply and other services to support the population of the new town? We suggest the Federal and State agencies be assured that adequate facilities will be developed and maintained in accordance with approved standards for housing, recreation, aesthetic amenities, transportation, etc.

Response: Wells will furnish needed water, and 10,000 acre-feet per year of additional water from Lake Powell is available if needed. The Kaiparowits Planning and Development Advisory Council is responsible for assuring that adequate services and facilities are planned for and provided.

128. County of Orange

(1) Comment: Page I-223. Provide a map at a smaller scale (1:1000 or 1:2000) which will clearly delineate the proposed right-of-way alignment and the locations of all proposed tower structures and access roads. Please provide same for the "Alternative Route." (See page VIII-182.)

Response: This material was not provided the EIS writers. The participants have not surveyed the proposed transmission line routes but rather have projected site locations. A corridor 1 mile wide was proposed so that transmission lines could be adjusted to avoid environmentally sensitive areas. Therefore, smaller map scales were not used in the EIS. Tower site locations and access roads will be identified after the survey is completed.

(2) Comment: Page I-248. Indicate the number of tower structures, the size and location of access roads, and the length of right-of-way which would be constructed within Orange County for the proposed route. Please provide same for the "Alternative Route." (See page VIII-192.)

Response: See previous response.

(3) Comment: Page II-168. Indicate the extent of vegetation removal and landform alteration necessary for construction of the proposed route by using maps and cross-sections. Please provide same for the "Alternative Route." (See page VIII-194.)

Response: The extent of vegetation removed and land form change has been estimated in Chapter III, pages 140 thru 146 of the draft. The same information for alternate routes is discussed in Chapter VIII.

(4) Comment: Indicate the extent of visual impact. Will tower structures and lines be silhouetted against the skyline? Will the towers and lines be visible from existing and proposed regional parks and scenic highways? If so, indicate those areas of tower and transmission line visibility and, if possible, provide mitigation measures. If the proposed alignment is selected, a variation of this route realigned to the north on the unpopulated side of the ridge above Silverado Canyon would be a meaningful improvement to the project.

Response: The visual impacts were described in Chapters III and V and are illustrated by a map. The least environmentally damaging route alternatives were addressed in Chapter VIII.

(5) Comment: Page I-248. Please provide a data sheet comparing the "Proposed Alignment" versus the "Alternative Alignment" to include those items listed above and all other proposed facilities and potential impacts. When completed, this sheet should provide a basis for selecting the least environmentally damaging alignment.

Response: A matrix of the proposed alignment compared to the alternative routes is included in Chapter VIII to provide a basis for comparison.

(6) Comment: Page I-44. Please provide the methodology used for determining the location of the "Proposed Alignment" and an explanation for selecting that alignment over the "Alternate Alignment."

Response: The proposed alignment was chosen by the participants. BLM has responsibility to evaluate and/or propose route alignments not chosen by the participants. Chapter VIII analyzes other possible alignments, some of which resulted from BLM proposals.

(7) Comment: Page I-230. Please discuss alternative tower designs which will "blend" or be more compatible with existing environmental conditions. County staff recently met with representatives of Southern California Edison Company and was provided photographs comparing visibility of conventional lattice type towers and newer Guyed-type towers. Such information should be in the EIS.

Response: Alternative tower designs were found to have little mitigating influence on 500 kV cross country systems. Since the Orange County routes would be located over rougher terrain, a free standing tower would be used.

(8) Comment: Page II-410. The project's impacts upon existing and proposed County Regional Parks should be identified, such as tower designs, recreational use of easements, alternate alignments, as well as any mitigation measures designed to minimize these impacts. The following parks may be impacted visually by the proposed project:

- a. Upper Silverado (proposed)
- b. Limestone - Santiago (proposed)
- c. Irvine (existing)
- d. Villa Park Dam Park (existing)

A copy of the Orange County Master Plan of Regional Parks (a portion of the County's General Plan Recreation Element) is enclosed for your information in this regard.

Response: Concur. Text has been revised in Chapter II under the Recreation Resources Section.

(9) Comment: At least one half of the Orange County portion of the project traverses areas designated on the County's General Plan Land Use Element as "Open Space." One purpose of this designation is to respect and preserve the unique scenic and open character of the Cleveland National Forest through careful and comprehensive planning. The proposed project reflects little regard for this open space designation as there is no account in the EIS of the project traversing and impacting officially designated open space areas. A copy of the County's Land Use Element is enclosed for your information. Construction as proposed would have detrimental effect on that open space. Various mitigation measures, careful realignment of the proposed route to avoid environmentally sensitive areas, or an altogether different alignment such as the Alternative Alignment or a variation thereof should be thoroughly considered.

Response: This information was not available to EIS staff writers. Since the EIS covers corridors instead of exact line locations, there is no way to evaluate open space designations.

(10) Comment: Page II-372. No mention is made of the adverse environmental impacts we anticipate affecting the community of Silverado.

Response: Small communities are not specifically mentioned in Chapter II, Land Uses; however, they are singled out in Chapter III. Impacts to Silverado Canyon have been discussed in Chapter III, Recreation Resources. Alternative routes to the proposal have been discussed in Chapter VIII.

129. County of Riverside

No response required.

130. Sun City Civic Association

Comment: The question arises as to the probability or possibility of placing these high tension lines underground in residential areas such as ours.

Response: The alternative of placing 500 kV ac transmission lines underground is discussed in Chapter VIII.

131. U. S. Environmental Protection Agency

(1) Comment: Insufficient modeling data are presented in the draft EIS for us to fully evaluate the impacts of the project, either at the formally proposed site (Fourmile Bench), or at the prime alternative site (Nipple Bench). Although additional modeling work has been completed for the Fourmile Bench site, these data were not completely presented in the EIS. If Nipple Bench continues to be seriously considered as a real alternative to Fourmile Bench, a comparable, or even expanded, modeling effort would be required there. All data should at least be presented in an appendix, and accurately summarized and interpreted in the text.

Response: Additional modeling data have been added to both the Fourmile Bench and Nipple Bench consideration. Data have been included in the reference material.

(2) Comment: If Bryce Canyon National Park and the Lake Powell National Recreation Area are redesignated Class I under the PSD rules, significant changes in the scope of the Kaiparowits Project would be required. This possibility must be thoroughly examined in the final EIS.

Response: Additional data and comment have been added to the Final Statement as they relate to Kaiparowits and potential Class I areas.

(3) Comment: All estimates for sulfur dioxide emissions and concentrations presented in the draft EIS assume 90% control of SO₂ with the use of scrubbers. If, for some reason, the participants choose to reduce the percentage of SO₂ control planned for the project, revised modeling information would have to be obtained, probably in the form of a supplemental EIS. Factors such as the sulfur content

of the coal and scrubber failures would have to be considered. The sulfur content of the coal is especially important, since lower average sulfur contents shown in coal analyses could conceivably tempt the participants to reduce their efforts for SO₂ removal. The final EIS should thoroughly consider these possibilities.

Response: The Final Impact Statement discusses both proposed emission controls, related emissions and emission controls required to meet the most restrictive applicable air quality standard. The rationale for the change in coal analysis is included in the statement. The "worst grade" coal (ash, Btu/lb. and sulfur) analysis which was used to calculate short term 3-hour and 24-hour concentrations did not change significantly. The average grade coal analysis used for long-term averages did change significantly.

(4) Comment: The smoke tracer studies were conducted by North American Weather Consultants in vicinity of Fourmile Bench on four days (November 11, 12, 13 and 15, 1973). November 11 was the only very stable case and winds at release height were greater than 15 miles per hour, which would give good mixing. The fluorescent particle tracer studies were conducted in May, 1974, which is the time of year when best dispersion is expected. The meteorological conditions during these tests did not include the poorest dispersion conditions. However, the dispersion rates determined during these times were used for input to the INTERCOMP model in making the air pollution concentration estimates. Therefore, the estimates included in the EIS made from the INTERCOMP model are not indicative of highest concentrations which might be expected.

Response: Additional model comparisons were made in the Final Statement. A portion of the additional modeling was done in cooperation with EPA, using the EPA model C7M3D.

(5) Comment: Only the INTERCOMP model and NOAA model results were elaborated on in the report, probably because they represent the lowest and highest

concentration estimates respectively. An errata sheet presents 1 and 3 hour concentrations estimated using the NOAA model and indicates that SO_2 levels predicted with this model are 5 to 20 times higher than those calculated by the INTERCOMP model (although still within ambient standards and significant deterioration limits). However, converting the maximum 3-hour concentration at Kaiparowits Plateau South ($425 \mu\text{g}/\text{m}^3$) to a 24-hour equivalent results in a concentration of approximately $170 \mu\text{g}/\text{m}^3$, which is well above the allowable Class II increment ($100 \mu\text{g}/\text{m}^3$). ALL of the modeling data should be included in the final EIS, and the conclusions regarding ambient concentrations corrected accordingly.

Response: See response to previous Comment No. 1. Additional evaluation of the NOAA model is included in the Final Statement and correction made.

(6) Comment: The final EIS should also discuss the consequences of relying on new coal analysis data which show that the average sulfur content of the coal to be used is lower by about 20% than indicated in the draft EIS. Emphasis on coal sampling and analysis during the mining operation, blending of coals, etc., is necessary to determine PSD compliance.

Response: See response to previous Comment No. 3.

(7) Comment: The final impact statement should document the extent of the brown atmospheric discoloration associated with the Navajo power plant's NO_2 emissions and any observable increase attributable to Kaiparowits. The EIS should further discuss the aesthetic and visibility impact of this brown atmospheric discoloration on canyons, drainages, and parks within sixty miles of the proposed site.

Response: Concur. The text under Air Quality - visibility section in Chapter III, has been expanded. How far the brown discoloration would drift into "canyons, drainage and parks within sixty miles of the proposed site" is unknown.

(8) Comment: The report should reference the monitoring program results at the Navajo power plant and discuss any increase due to Kaiparowit's emissions in ground level SO₂ concentrations.

Response: Results of the Navajo power plant sulfur dioxide field monitoring study have been utilized in the Final Impact Statement.

(9) Comment: The final statement should address the possibility that the participants may elect to reduce the control efficiency for SO₂ removal. Note that a decrease from 90% control to 80% control would result in a doubling of SO₂ emissions. This would affect compliance with PSD regulations at either site.

Response: See response to previous Comment No. 3.

(10) Comment: Probably the most severe particulate problem in the area is related to fugitive dust, both existing and contributed by operations supporting the facility. Wind blown dusts in the area already exceed the national standards in some areas in the vicinity and activities associated with Kaiparowits will increase the affected area. Additional information concerning this problem should be provided in the final EIS.

Response: Additional discussion of fugitive dusts generated by the Kaiparowits plant, supporting facilities and activities has been added to the Final Impact Statement.

(11) Comment: No attempt was made to predict the collective impact on the Navajo and Kaiparowits plants on ambient levels of SO₂ and particulates. A number of air quality studies are in progress in the vicinity of Navajo and its impact on SO₂ concentrations is much more significant than projected for Kaiparowits. The two plants are close enough to justify modeling together to insure that the collective contributions would not cause violations of the national standards. The air quality monitoring data taken in the vicinity of the proposed sites should be expanded to reflect the impact of Navajo.

Response: The potential interaction of Navajo and Kaiparowits has been discussed in Chapter VI of the Final Statement. The recently completed Navajo Generating Station Sulfur Dioxide Field Monitoring Program Study was utilized in the Final Statement. Additional air quality monitoring data provided to BLM by the Arizona Air Quality Section were also added to the Final Statement in Chapters III, V, VI and VIII.

(12) Comment: Data presented "characterizing" water quality conditions are not sufficient to establish baseline conditions due to the limited number of samples collected and gaps in parametric coverage, particularly heavy metals. Lab procedures used in sample analyses should have been cited, along with limits of detection, especially for toxic materials due to the concentrating and synergistic effects of these constituents on biotic communities even at very low concentrations. The final EIS should indicate how these data deficiencies will be corrected, and whether additional data will be collected.

Response: Concur. The comprehensive water-quality monitoring, mentioned in response to Letter 109, Comment 2, was initiated in the summer of 1975 and data are being collected. This information has been added to Chapter III of the Final Statement.

(13) Comment: A sampling program (baseline) for Wahweap and Warm Creek Bays is cited on pages A405-413. However, no reference is made to sampling frequency or the number of samples obtained. The March-May sampling period is inadequate to characterize ambient conditions (long-term). The notation on page A404 that data cited in Figure I (A405-412) supports conclusions identified in the Water Resources section of Chapter II is erroneous. There has been little or no relationship established between these two portions of the EIS.

Response: Concur. However, these data were not received in time to be analyzed for inclusion in the FES.

(14) Comment: There appears to be no basis for the statement on page III-117 that the average dissolved solids concentration of ground water out of the Navajo Sandstone formation is 750 mg/l. No dissolved solids data are shown for wells 18 and 19 on page II-129; information presented in figure 29, page II-131, indicates dissolved solids concentration from Pump Canyon Spring, fed from the Navajo Sandstone formation, to be 141 ppm, and the dissolved solids concentration measured in wells 18 and 19 are 1060 and 292 ppm respectively. Based upon this limited information, it cannot be stated that withdrawal of 5,900 acre-feet of ground water from the Navajo Sandstone formation would result in a salinity decrease in Lake Powell.

Response: Additional data collected after completion of the Draft EIS indicate that the Navajo Sandstone in the Glen Canyon City area may contain water which has about the same or slightly lower concentrations of dissolved solids as Lake Powell water; therefore, this analysis has been deleted from the EIS. Withdrawal of an estimated 9,690 acre-feet of water from the Navajo Sandstone would add to the salt concentrating impact of the proposed project on the Colorado River. However, this was not mentioned in the Final Statement as we do not know the actual quality of the water that would be withdrawn for the new town.

(15) Comment: Information and conclusions relating to the fate of trace elements especially mercury, from the generating plant and mine are insufficient and inconclusive. Additional work is needed in this area to more specifically define trace element emissions from the power plant; impacts of emissions upon the land, air and water; bottom and fly ash enrichment probability; and solubility/leachability of trace elements from the waste material. It is also unclear that background trace element analysis at Page is related to background levels at the Kaiparowits site. Based upon the limited information presented on trace element emissions, statements such as; "Effects of trace elements on the soils on Nipple

Bench would be the same as on Fourmile Bench -- of no consequences." (page VIII-263) are unfounded. Additional information concerning mercury in Lake Powell is available in a paper entitled "Mercury Levels in Lake Powell" (Potter, Loren, et al., Environmental Science and Technology, January, 1975, pp. 41-46).

Response: Additional discussion was added to the Final Statement concerning estimated mercury emission from the proposed plant and the deposition and movement into Lake Powell. Unfortunately no trace element analyses are available from air sampling at either of the proposed sites. Although some differences would be expected between airborne trace-element concentrations at Page and those at each site, the lack of industrial activity before Navajo, low population activity, and relative remoteness of Page should make it reasonable to assume that the concentrations of elements considered could be used as a base of reference.

(16) Comment: The statement on page IV-22 is incorrect and must be changed. It is stated: "Environmental Protection Agency Regulations require a no-return system. This is, water from the cooling towers cannot be returned to the source. The participant's proposed system is in accordance with these regulations." EPA Regulations do not require a no-return system. The Tuesday, October 8, 1974 Federal Register Steam Electric Power Generating Point Source Category, Effluent Guidelines and Standards, page 36201, 423.15(1) states: "There shall be no discharge of heat from the main condensers except..." cold side cooling tower blowdown and/or cold side cooling pond blowdown (emphasis added). Heat is considered a pollutant with respect to cooling water discharge, not the discharge of water itself.

Response: Concur. The text has been revised.

(17) Comment: Statements on page IV-18 are incorrect. It is stated that rainfall runoff will be retained in a basin for a minimum of 15 minutes as specified by effluent limitation guidelines established by the EPA.

Response: Concur. The text has been revised.

(18) Comment: The draft EIS has not adequately addressed problems associated with the treatment of sanitary wastes (domestic sewage) in the Kaiparowits impact area. Increased populations in existing towns, and the development of a new town, will increase the need for new or expanded sewage treatment facilities. For existing towns, the final EIS should mention what facilities now exist, and an assessment should be made of the likelihood that expansion will be required. For all cases in the impact area, the EIS should discuss the increased burden of more waste loads on area streams and rivers. Information concerning these problems should be available from the 5-County Association of Governments, now in the process of conducting a water quality management program for both point and non-point water pollution problems in the area, under Section 208 of the Federal Water Pollution Control Act Amendments of 1972.

Response: Concur. The EIS has been revised to include a statement in Chapter III regarding possible increased waste water treatment needs of towns that could have increased populations as a result of the proposed project. The latest information about the proposed new town provided by the participants indicates that the oxidation in the waste water system for that town would be nonoverflow.

(19) Comment: The EIS refers to the Colorado River Salinity Control Act of 1974 as the mechanism for controlling increased salinity concentrations resulting from Kaiparowits. Actual requirements for salinity control are derived from the Federal Water Pollution Control Act Amendments of 1972 (FWPCAA). In the December 18, 1974 issue of the Federal Register, EPA published regulations (40 CFR 120) setting forth a salinity control policy for the Colorado River system, procedures for establishing salinity standards, and a plan for meeting the standards. The Colorado River basin states are now adopting the standards and implementation plan. Measures for controlling salinity increases from Kaiparowits must be consistent with the state plans. Salinity control measures specified by the

Colorado River Basin Salinity Control Act should be viewed in the framework of the total salinity control plan developed according to the FWPCA.

Response: Concur. The text has been revised in Chapter III.

(20) Comment: EPA questions the projected energy needs presented in the EIS for the market areas that would be served by the proposed Kaiparowits power plant. The information in the following table was derived from the energy growth curves provided in Chapter I of the draft EIS:

Projected Energy Needs for Kaiparowits Market Areas Through 1985

Market Area Utility Company	Per Capita Energy Con- sumption (%Increase from 1973 to 1985)	Peak Demand Growth Factor from 1973 to 1985	Generating Reserve Margin in 1985 (% of total Generat- ing Capacity)
Southern California Edison Co.	54.7	1.8	21.6
Arizona Public Service Co. (APS)	90.5	2.8	19.2
San Diego Gas & Electric Co.	92.0	2.4	32.0

As shown in the above table, per capita energy consumption is projected to almost double between 1973 and 1985 in the market areas served by APS and San Diego Gas and Electric Co., and peak demand is projected to increase by a factor of 2.4 - 2.8 in these same areas. It is recognized that the projected increases in per capita consumption and peak demand are in part reflective of past growth rates. However, the past growth rates represent a time when electrical energy was considered to be abundant and cheap, and was used inefficiently and wastefully. Since readily usable energy sources are very limited, it is obvious that energy consumption cannot continue at past growth rates.

Consideration should be given to including in the final EIS an independent study of projected energy needs for the market areas of Arizona and southern California. Such a study would consider the limited supply of energy resources, the rising costs of energy development, conservation practices that will become necessary, and the limited carrying capacity of the market areas. The study cited in the EIS, which was conducted by FEA, cannot be considered "independent", since energy forecast data were supplied only by the participants.

Response: Refer to response to Rudolph's Comment No. 6, hearings section.

(21) Comment: The generating reserve margins shown in the table above also deserve further attention. If each utility maintains such a margin, the implication is that as a nation we have a 15-20 percent reserve in generating capacity. Is such a large margin justified considering the system costs and adverse environmental impacts associated with maintaining such a reserve? How realistic is the peak demand upon which the generating reserve margin is based? Present peak demands rise considerably above the base load -- can this country afford the luxury of such peak load excursions in 1985? Readjustment of working and industrial schedules could considerably reduce the peak demand loads.

Response: It is true that utility companies attempt to achieve about a 20 percent margin, individually and collectively. There is even some concern that a 20 percent margin is not great enough in these days of very large units when a single breakdown can remove a substantial portion of a company's total generating capacity from the line. A new unit can be expected to generate electricity in excess of 90 percent of the time, allowing for normal maintenance, but as units get older, they become less reliable and subject to more frequent breakdowns. Also, a company's generating capacity changes in rather large discrete jumps, as new units come on line and older ones are taken off, so that

it is difficult to maintain any particular margin for very long. Therefore, the buying and selling of power among utilities is very much a factor in their planned operations.

(22) Comment: Limestone quarry and limestone transport. Additional mine design criteria will be needed to evaluate the effectiveness of proposed runoff control measures and revegetation efforts at the limestone quarry.

Will diversion structures be placed above the mine cut to prevent runoff from entering the active mine? Will it be necessary to dewater the mine during operations? If more water is available than needed for dust suppression, how will it be handled? Has the water right problem associated with the limestone quarry been resolved?

Response: The participants do not have this information available at the present time. Detailed quarrying plans will not be available until completion of an intensive drilling program.

(23) Comment: Under the Alternative section for the limestone quarry, one site, Buckskin Mountain, is named on the map, but not described. Provided the limestone source here meets the quality criteria, the location would offer transport distance advantage and eliminate the impact to Bryce Canyon National Park. Regarding the proposed alternative, does the company propose to mitigate the truck noise level in any manner? EPA has established noise emission levels for interstate motor carriers over 10,000 pounds as of October 15, 1975. Though these regulations will not legally apply here, we recommend that trucks meeting those standards be purchased for this operation in order to reduce the effects on the communities of Tropic and Cannonville. An evaluation of the road maintenance requirements as a result of the heavy truck load along the proposed route could be included in the final EIS.

Response: Concur. The text has been revised in Chapter III to include this information.

(24) Comment: Coal mine. Additional information is needed regarding the coal mining plan to evaluate the mitigating measures proposed to reduce subsidence. The report indicates that under areas of low cover, particularly below canyons, enough pillars will be left to reduce subsidence. We endorse such mining techniques, but in order to evaluate their completeness, request that either details of the mining plan be included in the EIS or the mining plan and its environmental analysis be distributed for public review prior to USGS approval.

Response: Concur. The text has been revised in Chapter III. If the project approved, the Area Mining Supervisor of the U.S. Geological Survey will require, supplemental to the mining plan on file, a map showing the areas of the mines which would cross under canyons and other features requiring subsidence prevention.

(25) Comment: The impact of the proposed aggregate site is not fully evaluated nor are alternate sites. There are no mitigating measures presented for exposure of ground water as a result of aggregate removal, and it is not substantiated that: "after a few storms, all traces of aggregate pits would be obliterated."

Response: As stated in the section describing (mitigating) measures proposed by federal agencies in Chapter IV, draft and final statements, stipulations to protect the environment are drawn up by managing officials for proposed aggregate mining on public lands. The stipulations would include reclamation. The requirements described in the statement are general, as indicated, because specific plans for aggregate removal are not presently available to federal agencies. As noted in Chapter IV, requirements would be site-specific upon

submittal of detailed plans. They would include attention to exposure of ground water for instances where this may occur.

The alternate sites were not evaluated at this time as it is not known which sites would be used by the participants. In the case of exposing ground water, Chapter IV has been rewritten to identify that a permit from EPA will be needed in the event that water needs to be pumped in order to dry out the aggregate pit. By confining the aggregate pits to the main flow channels they would act as settling basins and fill up with sediment which has been washed down from the upper reaches of the water course. This would obliterate any evidence of the aggregate pit over a period of time.

(26) Comment: More attention should be given to the secondary impacts that would occur in the market areas as a result of building Kaiparowits. The EIS does recognize that the additional electrical power would facilitate urban growth and sprawl and that the "quality of community life would probably decrease even while per-capita income increased."

Response: Refer to our response to Letter No. 6, Comment No. 62.
Also, see response to Fradkin's Comment No. 5, hearings section.

(27) Comment: The EIS should indicate that the use of scrubbers for SO₂ removal will also help reduce mercury emissions. Although no standards have been established to control mercury emissions, the fact that mercury levels can be reduced with scrubbers should provide an additional incentive for their use.

Response: See response to Atwood's comments in the Hearings comments section.

132. Morongo Basin Conservation Association

No response required.

(1) Comment: I would take this opportunity to respond to the Draft E.I.S. on Kaiparowits Power Project. To begin with the Draft E.I.S. seems to be deficient in its research on the impact on the environment. Throughout the document there are statements to this affect: " may have unknown impacts on the environment"; "there is presently insufficient data..."; "data is not available to assess the affects of the existing Navajo Power Plant on the air quality of the region"; "no significant affects on regional climate could be expected". It is my understanding of N.E.P.A. that the E.I.S. gives the reader what the specific impact of the project will be on the natural and human environment.

Response: The information regarding the Navajo power plant was not available until September 30, 1975. It is now included in this Final Statement. The National Environmental Policy Act does give direction to analyze specific impacts on the natural and human environment where information is available. But it also recognizes that not all information is available in order to analyze such impacts and, therefore, does not demand that the statement be deferred until all information does become available.

(2) Comment: The Draft E.I.S. is consistent in not knowing the impact on the natural environment as I have shown above. Can we afford to proceed with such a massive project with no real concept of what the long term affects will be? Can we afford to emit trace elements into the atmosphere without knowing their impact on the natural and human environment? What value has been placed upon the air? I do not feel the Draft E.I.S. is acceptable in this regard especially in regard to the project's affect upon the air.

Response: See responses to Phillips' Comment No. 2 and Crall's Comment No. 1, in the Hearings comment section.

134. Dr. Claron E. Nelson

(1) Comment: Experience has proven that whenever private costs and social costs diverge, our fundamental objectives of efficiency and equity in resource development activities are not served. Discussion relating to development of a community to support the Kaiparowits project are short-sighted. The necessary conditions for long-term community stability have not been met. The life of the project has been estimated at 35 years. During this period, the company will amortize its production-related investment. However, what will happen to the town when all or part of the operations cease? There is no assurance that substitute activity will be available to provide employment. The relative locational disadvantages of the proposed town sites for all but extractive economic activities are obvious. Considerable personal hardship could result for the residents of the community whenever the economic base evaporates. Years of investment in homes, businesses, social capital, etc. would become of little value.

Other residents of the state would not escape the effects of the cessation of operations. Undoubtedly, political pressures would result in direct financial support for the community and its resident. Also, the migration of the unemployed from the community would create additional problems in other areas of the region. It appears very unwise to knowingly create an economically depressed area, even though it will be some years in the future.

Response: No definite plans have been developed for this long-term eventuality. An attempt would be made to diversify the community and regional economy, but as stated, at least some businesses and industries would be reluctant to invest in the development of a business site in a region or economy that is, in their minds, recession oriented.

(2) Comment: Establishment of a company-town, attractive to prospective employees, is an alternative which should be given careful evaluation.

Response: Concur. The text in Chapter VIII has been revised.

(3) Comment: The second concern is with the interactive and agglomerative effects of the construction of several large coal-fired units, now proposed, in the southern part of Utah. The public interest cannot be served by the evaluation of each proposal on an individual basis. The aggregative impact on the environment and the economy must be determined. The general welfare provision of NEPA dictates, in this instance, evaluation of the known proposals on an area basis.

Response: Refer to response to Rudolph's, Comment No. 7, hearings section.

135. William Gallagher

(1) Comment: I feel that the "need" for the proposed Kaiparowits Project has not been proven, especially at the risk of causing irreparable damage to the delicate environment of Southwestern Utah. The stated rationale for building this extensive coal-burning power plant is based on a historic 6.8 percent annual growth rate. However, the Federal Power Commission recently released figures which showed that the total sales of electric energy increased only 0.5 percent from April of 1974 to April of 1975.

Response: Refer to response to Rudolph's Comment No. 6, hearings section.

(2) Comment: I object to the statement in the Summary (Page III-11) that a "small coalition of resident and non-resident conservationists would be disappointed if the project were approved". Certainly, the millions who visit this scenic area will also object to the damage caused by the Kaiparowits Project.

Response: See response to Hassel, Comment No. 20 in the Hearings comments section.

(3) Comment: Viable alternatives exist for the use of this large supply of coal, and consideration should be given to exporting the coal away from the area of high-quality recreation to an area in the country more suited to the burning of this fuel. The burning of coal at the Kaiparowits Plant in southwestern Utah for the consumption of energy by the people in Southern California is the equivalent of the major cities of the Southwest exporting their pollution to the Nation's most beautiful and scenic National Parks and Recreation Areas.

Response: Refer to Chapter VIII on alternatives which has been expanded in the Final EIS.

136. Operating Engineers, Joint Apprenticeship Committee

No response required.

137. Jim Ferrel

(1) Comment: I noticed while reviewing the EPA statement that the sociological impact was not fully explored. Significant questions were not answered. In the EPA draft pp.III 279-283 graphs show that the townships of Kane County give the project a much lower margin of support than other towns. What is the reason? Do they feel the townsite built for the workers is too close, or that they would lose political power? Or what? Also, most arguments have not succeeded in making the social environment distinct from the natural one. The EPA asked people if they considered economic or environmental considerations to be most important. The question confuses what the answers imply.

Response: Refer to response to Swenson's Comment No. 1, hearings section.

(2) Comment: I feel that a more feasible means of waste disposal needs to be found without contaminating underground water or the Colorado Drainage System.

Response: The means of waste disposal which were analyzed are those proposed by the participants. BLM did not analyze other methods. Disposal methods proposed by the participants are current with the state-of-the-art.

(3) Comment: With the proposal of four additional power plants in Southern Utah it is imperative that the plants of the whole region be considered together. Not only should we be concerned with the environmental damage one plant does but the sum total of all plants. It is twice as startling to know five such plants are in 200 mile diameter of shrinking but still actual aesthetic wilderness than one additional plant.

Response: Refer to response to Rudolph's Comment No. 7, and Janke's Comment No. 2, hearings section. To the extent that data was available, Chapter VI discusses the potential air quality impact of potential interaction between Kaiparowits and Navajo.

138. Blanche Clegg

(1) Comment: In my study of the EIS Draft, I noticed that although the Impact Statement was to have considered impartially alternate sites for the building of a new town, in some instances data is given only for East Clark Bench. This seems more prejudicial than the Impact Statement should be.

Response: Favoritism, or bias, is not intended. However, it should be noted that the Kaiparowits Planning and Development Advisory Council favors the East Clark Bench alternative. Also, more data was available on the East Clark Bench alternative.

(2) Comment: The Impact Statement expresses defeatism, saying controlling use of off-road vehicles would be very difficult and considerable damage would likely occur.

Response: To adequately control off-road vehicle use would require considerable more manpower than is presently available to the involved federal, state, and local agencies. Historically, federal, state, and local agencies have been slow in appropriating funds and manpower for control of ORV users.

139. Department of Employment Security, Panguitch, Utah

No response required.

140. Peter Hovingh (Escalante Wilderness Committee)

(1) Comment: One can readily see that most of the Kaiparowits power (2628 mwatts) will be resold once it comes into production, whether this capacity is sold from Kaiparowits or Navajo, or Mojave is not the question (See Figure 1). Once electricity is in the lines, along with interlocking system, the source is not recognized. Thus paragraph 2 under projected customer use is totally misleading and typifies utility advertising.

Response: Refer to response to Rudolph's Comment No. 6, hearings section. Also, see response to letter No. 131, Comment No. 21.

(2) Comment: Figure 2 shows that SDGE is above the area averages for generating reserve margin. If one takes this surplus over 20% (i.e., 9%) one finds an additional mismanagement of 370 megawatts. (TOTAL MISMANAGEMENT PROJECTION IS NOW 2628 + 370 or 2998 MEGAWATTS)

Response: Refer to previous comment.

(3) Comments: Figure 3 shows another cancer in projections. It behooves me to understand these figures. Arizona and southern California have a very similar ethnic, industrial, and agricultural base. Yet per capita Arizona utilities (APS and SPR) forecast twice the usage of electricity per capita. If we halve the APS and SRP projected planned generating capacity for 1985 we can

save 2600 megawatts for APS and 2700 megawatts for SRP and then the Kwatts generating capacity per capita is in line with California.

Response: Refer to previous Comment No. 1.

(4) Comment: NOW THE TOTAL MISMANAGEMENT CAPACITY OF THE CONSORTIUM IS $2998 + 2700 + 2600 + 8298$ MEGAWATTS BY 1985. Does this call for the construction of Kaiparowits? In agreement with the FEA on page I-40, demand forecasts are often disputed. However, the figures used above are THOSE of the utilities. It appears to me that the FEA has not looked closely enough at the companies figures. The fact that the FEA verification did not even question these consortium estimates suggests to me that the FEA consists of Utility presidents and Board of Directors. From the data presented in Figures 1,2, and 3 it is not surprising that SRP dropped out of the picture.

Response: Refer to previous Comment No. 1

(5) Comment: Then on page I-43 and again on VII-2, the amount of money to be saved by not importing foreign oil is totally out of place in view of the above discrepancies and the fact that the economics (cost/benefit ratios) are not at all discussed. (Unfortunately, economics and the environment are so closely tied together that one should not separate them in an environment report. But if one brings up economics, one should discuss the entire economic picture not just the portion saved by not importing foreign oil or mining less than 4 foot seams). The amount of projected waste (8298 megawatts) is a lot of capital tied up (also higher electrical rates for consumers) just to obtain low cost water, low cost coal, and a 35 year or longer regional devastation.

Response: Refer to previous Comment No. 1

(6) Comment: One mentions several times that the plant life of 35 years "does not mean that Kaiparowits would necessarily lose its usefulness at the end

of 35 years" (I-55). Yet on I-100, 101, the evaporating ponds are designed for only 35 years. How much of the other aspects of the Kaiparowits are designed for only 35 years? Will another EIS be filed after 35 years?

Response: The plant life of 35 years refers to the amortized life of the plant. It is recognized that the plant would last longer. If the plant is maintained during its operation, all the facilities would last as long as needed. No new impact statement would be filed 35 years after the project begins operation.

(7) Comment: Page I-130 makes mention that is is uneconomical to mine beds less than 4 feet thick (this was alluded to earlier in this statement). Uneconomical is not the question. At what price does it pay to mine the coal in two foot seams. It is assumed that what is uneconomical for the consortium is uneconomical for the country. Yet the country has about run out of natural gas, oil is in great shortage, and now it looks like we are about to waste our coal resources. Nowhere in the report is brought up the idea of a National Coal Reserve for the year 3000 A.D. Kaiparowits Coal Field could be just such a reserve.

Response: We agree with your comment on the economics of mining coal. The text has been revised accordingly. Concerning the National Coal Reserve, it is not the purpose of the EIS to establish this concept.

(8) Comment: Page I-130 mentions that 52000 tons of coal will be mined 5 days a week, 230 days a year. On page I-56 it mentions that the coal has 12.55% water (probably locked up with the carbon). This amounts to 6526 tons of water a day. From the conversion ratios: 1 gal water = 8.33 lbs, 7.5 gal water= 1 cubic foot, and 1 acre foot is 43560 cubic feet, and of course 1 ton is 2000 lbs, it is calculated that one "burns" 4.8 acre feet of water a day or 1104 acre feet a year. This is not a trivial amount of water, especially in the desert, and especially in consideration that the mine will utilize 3100 acre feet of

water a year. This water is wasted. Yet there are coal processes that utilize coal and water to form hydrogen, methane/methanol, and diesel fuel. The hydrogen can then be used to form ammonia- a fertilizer. Although there probably would be pollution, and a large requirement of water, the water in the coal would be utilized. Thus 1100 acre feet is lost. No section of the report discusses this aspect of coal water and who has jurisdiction over it, and who can lease it.

Response: The discussion on the alternative uses of coal has been extended in Chapter VIII.

(9) Comment: Concerning the employees and the New Town, it is mentioned that "optimum construction scheduling would require periodic use of a second shift" (I- 270). How many people would be brought in on a second shift? If one doubles the construction generating station, an addition of 2405 people would be required. How can one plan a new town and have such a variable? It is this second shift (shaft) that brought disaster to Rock Springs. Alternatively one can plan- not that which is most economical to the consortium, but that which is most economical to the region. Overtime pay is the usual process to get more work.

Response: The text of Chapter III, Socioeconomic Section, has been revised to discuss the unplanned impacts of related power projects located in Rock Springs and Gillette, Wyoming. Also refer to appropriate changes in Chapter I.

(10) Comment: There seems to be a deficiency in housing. Figure 4 shows the problem. It looks like there is deficiency in housing for 600 persons a year. Temporary housing (I310) for the first year does not begin to cover the 501 deficiency. Presumably the town construction itself would require personnel and that is not mentioned in I-272. This would make all the deficiencies even greater. Perhaps the bachelor quarters make up the difference. The 400-600

bachelors however will require some kind of prostitution if they live in the new town for very long. Then of course, if one tosses in the second shift (instead of overtime), the entire housing plan is instantly obsolete. Contingency planning is of course characteristic of the energy towns in Wyoming and Montana.

Response: Temporary quarters at the marshalling and construction area near Glen Canyon City would adequately house plant and town construction workers during the first year. However, this would still create an impact in Kane County. This has been discussed in Chapter III, Socioeconomic Section. Also, refer to Chapter I, Power Plant.

(11) Comment: There is still some sunshine in the region. Solar heating is presently available and works. The only plus for the new town would be a requirement of solar heating in all temporary and permanent housing. This is not even considered. More electricity will be required to supply the new town. Is this the reason for the 'proposed' Garfield Plant of UPL?

Response: The use of solar heating is discussed as one alternate source of power in Chapter VIII. There are ample sources of electric power from existing power plants in Utah to supply the new town.

(12) Comment: Page III-48 and many other places mentions that the effects of the Navajo plant are not known when assessing air pollution and other effects. It seems that before Kaiparowits even begins, all the effects of the Navajo plant should be studied and questions answered! The plant should be running for ten years for "better" averages. Fortunately we see that the Kaiparowits plant need not be built for ten years (VIII-8).

Response: The effects and problems of potential plume interaction between Navajo and Kaiparowits power plants is presented in Chapter VI of the Final EIS.

(13) Comment: I thought that by now the question of water consumption was all thought out. I was surprised the limestone quarry water was not available unless agriculture was sacrificed. The quarry workers would increase the water needs of Antimony and Tropic by 41%. No mention was made whether this water is available.

Response: The employees residing in Antimony could draw upon the Sevier River Drainage water supply. The source of potable water for employees living in Tropic is unknown at the present time; however, water rights could be purchased from existing agricultural users.

(14) Comment: There are many other concerns. On III-270 taxes generated are given. Now where in the report will be the cost to the Federal, State, or local government. Can one appreciate taxes generated unless they are balanced by expenses. Either economics should be brought in or left out. I know that governments always spend more than they receive so I would suspect that the benefits from the taxes would be non-existent-assuming that most of government's spending goes to costly destructive dam-building, war-making, and highway wasting projects.

Response: The text of Chapter III, Socioeconomic Section, has been revised to include costs in general terms, but not in detail.

(15) Comment: On I-313 under actions required of government agencies. When one moves 15,000 people (transients, itinerants, immigrants, etc.) who have no understanding of the land into an area where 3000 people have struggled, lived, and loved the land, it seems that government action will have to include increasing by 10 fold the numbers of people to watch and protect the land from misuse. In the report reference is made several times to poaching of game and livestock since the construction of Glen Canyon Dam. Reference is mentioned of

the destruction that will be caused by ORV for a 100 mile radius. Will Kaiparowits ever pay for this destruction since it is almost a certainty. Or will the Federal and State Government increase their personnel in the region? The personnel needs to be there on Day 1 of year 1, not after the destruction has created a emergency Act! Where is this Action of the Federal and State Government?

Response: No proposal has been made to provide any additional federal or state protection for the Kaiparowits Plateau environment from ORV use. Any molesting or destruction of wildlife would come under the jurisdiction of state laws.

141. Western River Guides Association, Inc.

No response required.

142. Metropolitan Water District of Salt Lake City

No response required.

143. National Campers and Hikers Association

No response required.

144. The Desert Protective Council, Inc.

No response required.

145. Nicholas S. Van Pelt

(1) Comment: The data supplied by the poll exhibited in the section on description of the socioeconomic environment are very interesting in this regard; in one instance they reveal what a high percentage of the work force does not plan a change in job should "substantial development" occur. Does this mean that the project really only needs to be built and operated, as far as southcentral

Utahns are concerned, for those few who are unemployed or who wish to change their present job when there is an opportunity such as this? Or do many who presently hold jobs which presumably provide a reasonable level of livelihood anticipate getting fat off the project?

Response: See response to Swenson's Comment No. 1, hearings section.

(2) Comment: I feel that, of the alternatives you discuss which involve coal mining on the Kaiparowits Plateau, that a coal mine and railhead contains the best set of tradeoffs. I think that the rate of coal extraction should however be much less than 12 million tons planned, in order to extend the life of the mine and to reduce the periodic labor requirements so as to more nearly confine employment to local residents.

Response: Your views are valid. However, the participants have proposed the project based upon demands and forecasts which require 12 million tons of raw coal annually. Reserves of the region far exceed the proposed 35-year life at 12 million tons annual consumption and, in reality, the plant could continue to operate far beyond that period. The local labor market potential falls short of the project's needs.

(3) Comment: I do not see enough attention given to the probable effects of station emissions on cryptogamic flora, which composes part of the flora of pinyon-juniper stands in the region, especially on "relict" sites which have been minimally disturbed by livestock and range treatment activities. Studies in Europe and in the Southwest have noted the bad effects of oxides of nitrogen and sulfur on lichen communities around urban regions and around the Four Corners plant. The effects of Kaiparowits emissions on cryptogamic flora may just be restricted to the zone close around the plant, or may only be harmful in combination with the pollutants from other coalfired plants, but they deserve much more consideration. A lessened cryptogamic cover, in addition to the destruction of

natural life forms, will mean increased sedimentation, lessened scenic quality and research value. Below is a verbatim abstract of a paper given at the Nineteenth Annual Meeting of the Arizona Academy Sciences at Tempe in April 1975, titled "Lichens as Indicators of Air Pollution in the Four Corners Region", by Janet E. Marsh and Thomas H. Nash III:

Lichens are believed to be the most sensitive group of plants to air pollution. To investigate this phenomenon a study of lichen distributions at 110 sites within a 40 mile radius of the Four Corners Power Plant near Farmington, New Mexico, was initiated during the summer of 1974. The distributions of over 100 species were mapped for the 110 sites. In addition, quantitative sampling at selected sites indicate that for the ubiquitous species, Parmelia mexicana Gyeln., Parmelia substygia Ras., Caloplaca trachyphylla (Tuck) Zahlbr. and Lecanora novomexicana, an inverse relation exists between the abundance of these lichens and distance from the power plant. Fruticose lichens, the most sensitive group of lichens to air pollution, were not found within a 20 mile radius of the power plant.

Response: To date no definitive studies have been initiated regarding the effects of pollutants on lichens within the Kaiparowits Plateau area. The Environmental Protection Agency has stated that the importance of long-term average concentrations versus many shorter terms of concentrations on the reaction in lichen populations awaits critical study.

(4) Comment: I think that the destruction of part of the very old pinyon-juniper woodland at the Fourmile Bench site, and the more gradual damage done by the released salt, should disqualify this site as a location for the generating station. There are rather few areas on the Colorado Plateau with such old specimens-and we have rather poor knowledge of their distribution and seriousness of the loss of the Fourmile Bench stands. I do not think that mitigating actions should consist merely of dendrochronologic "salvage" before the site is bulldozed-such stands deserve protection.

Response: Proposals for dendrochronologic studies on Fourmile Bench have not been made at this time. Brigham Young University has made statistical

analyses of increment bores, which are the bases for age estimates. However, the only measure proposed for mitigating the impact of pinyon-juniper removal is the participants' plan to use proposed plant component sites as construction areas, thereby reducing the area of disturbance.

Comments received after preparation of the statement (from November 17, through December 31, 1975).

Public comments were received after the November 14, 1975 deadline. Since most of the statement had already been completed, the late comments were not considered for rewrite purposes. However, a response was made to each comment contained in the letters. The comments and responses, numbered 146 through 155, have been included herein for public review. Letter No. 148 contained the same comments as received from the same source earlier, and consequently, the letter was not duplicated here. Printed copies of the letters are included in Exhibit B. The letters are as listed below.

<u>Letter Number</u>	<u>Agency, Organization or Individual</u>	<u>Page Number</u>
146	U.S. Dept. of the Interior, Bureau of Indian Affairs	IX-424
147	Ecology Center of Southern California	IX-424
149	State of Nevada, Governor's Office of Planning Coordination	IX-425
150	Mohave County Board of Supervisors	IX-429
151	State of Arizona, Office of Economic Planning and Development, Dept. of Health Services	IX-429
152	U.S. Dept. of the Interior, Bureau of Mines	IX-430
153	U.S. Dept. of Agriculture, Soil Conservation Service	IX-432
154	U.S. Dept. of Agriculture, Forest Service	IX-434
155	Federal Energy Administration	IX-439

Comments received after preparation of the statement (after January 1, 1976).

Two comment letters were received after January 1, 1976. Since the statement was completed at that time, responses were not included in this chapter. However, the letters, numbered 156 and 157, have been presented in Exhibit C for public review. The source of the letters are indicated below:

Letter
Number

Agency, Organization or Individual

156	State of California, The Resources Agency of California
157	Energy Research and Development Administration

146. Dept. of the Interior, Bureau of Indian Affairs

No response required.

147. Ecology Center of Southern California

(1) Comment: The information presented in the Draft Impact Statement is seriously deficient in its estimation of future electrical energy demand for the SCE and SDG&E service areas. The uncritical acceptance of utility forecasts shows a failure to independently evaluate all phases of this project.

Response: See response to Rudolph's Comment No. 6.

(2) Comment: If the project can be delayed without serious disruption of energy supply to the southern California utilities' customers, then not only can the adverse environmental impacts be postponed, but most important time for energy conservation measures to take effect can be bought by such postponement.

Response: The discussions on alternatives including energy conservation and delay have been expanded in Chapter VIII of the FES.

(3) Comment: In one of the most cavalier statements ever to appear in an impact report, we are told that "a small coalition of resident and nonresident conservationists would be disappointed if the project were approved." (DEIS, p. III11) The people who enjoy the natural and scenic values of the southern Utah/northern Arizona region are neither a "small coalition" nor are they entirely made up of a recognizeable segment of "conservationists".

Response: Concur. This statement has been deleted from Chapter III of the FES.

(4) Comment: In addition to the air quality impact, the impact upon tourists and others enjoying Bryce Canyon National Park has not been fully assessed. Thirty round-trips per day through the Park will be required, the

effect on traffic patterns and safety will be considerable but apparently have not been considered among the projects impacts in the DEIS.

Response: The discussion of the impact on tourists in Bryce Canyon National Park has been expanded in Chapter III of the FES. 148. Dept. of the Interior, Geological Survey

148. Duplicate letter. No response required.

149. State of Nevada, Governor's Office of Planning Coordination

(1) Comment: We believe that there should be additional explanation and identification of mitigating measures regarding possibilities of Colorado River quality degradation after the life expectancy of the plant when there is no maintenance of the fly ash, mine, and blowdown evaporation disposal sites.

Response: The Final Statement includes mitigating measures to protect Colorado River water from potential contaminants generated by the proposed project. Those measures proposed by the participants as part of the project design are intended to be effective for many years after completion of the project. Therefore, the participants have not proposed additional mitigating measures to be implemented after the life of the proposed project.

(2) Comment: We would suggest that the environmental statement reflect this Division's authorities in the Eldorado Valley and Fort Mohave Development Areas. The State of Nevada has the option to purchase these areas pursuant to Public Laws 85339 and 86433, respectively. In this regard we believe that this Division should be listed as contact on page IX7 of the statement.

Response: The authority of the State of Nevada Division of Colorado River Resources is recognized; however, the comment was received too late to be incorporated in the FES.

(3) Comment: We note that the "Northern Kaiparowits-Mohave 500 kV Transmission Line Preferred Alternate" would open a new corridor through the northern portion of the Eldorado Valley Development Area. We believe that such a new corridor must be subjected for approval by this Division.

Response: The potential impacts of a new transmission line corridor on future development in Eldorado Valley are assessed in Chapters III, V, and VIII of the FES.

(4) Comment: Is the 90% removal of SO_2 legally binding?

Response: There are no air quality regulations which apply to the Kaiparowits proposal which specifically require 90 percent SO_2 removal. Calculated SO_2 control required to meet the most restrictive applicable air quality standard (Class II incremental increase of the Prevention of Significant Deterioration Regulations) would be 82.8 percent.

The Air Conservation Committee of the State of Utah has stated: "The Kaiparowits proposal received concept approval on the basis of submitted specifications which included controls: 99.5 percent for particulates, 90 percent for SO_x and 30 percent for NO_2 . At the present time, to the best of our knowledge, these represent the maximum controls technically feasible, thus would meet the State Air Quality Regulation 1.3. As a matter of fact, we are not convinced that the presently available technology would achieve 90 percent SO_x from power plant stack gases; however, we anticipate that the technology will be sufficiently improved to do so by the time it is needed for Kaiparowits".

(5) Comment: Will there be any impact from the water formation due to the combustion?

Response: Water formation due to coal combustion is estimated to be approximately 16,400 tons per day which is approximately equal to 4,600 acre-feet per year. This can be compared with the evaporation rate from Lake Powell of

approximately 519,000 acre-feet per year. We know of no documented climatic changes because of this lake and we therefore do not expect climatic impacts from this source.

- (6) Comment: How much water will be formed due to combustion?

Response: Refer to response to previous Comment No. 5.

- (7) Comment: Will the waste gas stream be reheated to eliminate the visible steam plume?

Response: The waste gas stream will be reheated to approximately 180° F. Plume from the power plant stacks would be visible at times during cold weather conditions but since stack gases are reheated above the dewpoint temperature, the length and frequency of these plumes would be less than for those from the cooling towers. (Draft EIS, page III-38)

- (8) Comment: There should be an ambient air network around the site. A minimum of five (5) sites. This is especially true because of the major differences between the NOAA and Intercomp models.

Response: BLM concurs that predictive diffusion modeling is only an approximation of expected ground level concentrations and that the final definition of impacts depends upon well planned and executed field measurements. The participants have stated that they plan to monitor air quality before, during, and after project construction and operation. Some preliminary planning has been done with Eyring Research Institute at Provo, Utah.

- (9) Comment: Emission from off-road vehicles and unpaved roads were not considered.

Response: Discussions on emissions from off-road vehicles and fugitive dust generation from off-road vehicle activity and activity on unpaved roads were revised in Chapter III of the Final Statement. It is not possible to set accurate

figures on such activity because of the uncertainties of vehicle numbers, amount of activity by season, miles traveled or unpaved roads vs. paved roads, etc.

(10) Comment: Some provision should be agreed upon for maintenance of storm water controlling structures after the life of the project to prevent the ash disposal site and accumulated salts from the evaporating ponds from entering Lake Powell.

Response: Refer to response to previous Comment No. 1. According to the participants, the retention facilities planned for those wastes would last many years, and, therefore, additional mitigation (such as continued maintenance) would not be required after the life of the project.

(11) Comment: Is any water quality sampling of perennial surface waters in the impact area being now carried out? Such data will provide background information after the project is initiated to assess the function of storm water control devices, blasting at the Limestone Quarry, and urban runoffs from new paved roads and the new town.

Response: Refer to response to Letter No. 109, Comment No. 2.

(12) Comment: Could the storm runoff water in a "clear water pond" (which should be equal to or better than ground water) be used to replace that lost from Tom Best Spring and Reynolds Spring should the water table drop as a result of the Quarry Project?

Response: It is unlikely that the water table would decline as a result of the proposed quarry operation, but spring flow could decrease by effects of the quarry operation on rock permeability. Any water-right problems that might evolve would have to be resolved through the Utah Division of Water Rights.

It is true that ponded storm runoff could be an alternate water source (physically, if not legally) in this area. However, the supply would be less dependable than springflow, and the quality of ponded storm runoff degrades rapidly owing to evaporation between storms.

(13) Comment: What percentage increase in ground water salinity can be expected if mine and quarry blasting, subsidence, and changed flow characteristics allow an interface between fresh ground water and saline surface waters?

Response: There are insufficient data at this time to quantify this impact. The range of dissolved solids concentration of most water samples collected from exploratory drill holes in the coal lease area, was between 500 and 2,000 milligrams per liter. This would indicate that any mixed water would not have concentration of dissolved solids in excess of 2,000 milligrams per liter. It should be noted however, that several other ground waters sampled in the area contained more than 3,000 milligrams per liter of dissolved solids. It should also be noted that as stated in the EIS the principal aquifers (in the Navajo Sandstone) would not be affected by the proposed coal mine.

150. Mohave County Board of Supervisors

Comment: We strongly urge the formulation of regional energy resource development plans and policies.

Response: See response to Rudolph's Comment No. 7 and Janke's Comment No. 2.

151. State of Arizona, Department of Health Services

(1) Comment: Principal concern is the lack of or improper consideration that four additional coal-fired power plants are proposed for construction in the vicinity and that an existing power plant (Navajo) with two units already in operation and another nearing completion is only 30 miles to the south. The

combined impact of the proposed and existing plants upon the ambient air has not been evaluated. The Kaiparowits impact on air quality appears to be based upon the assumption that background pollutant levels are zero. Such background concentrations certainly are not the case now, and with the construction of additional power plants in the area, will certainly increase.

Response: See our response to Rudolph's Comment No. 7, and Janke's Comment No. 2. Also, refer to Chapter VI, for a discussion on cumulative air quality impacts on interaction between the Navajo plant and Kaiparowits.

(2) Comment: The draft environmental impact statement included minimal discussion of significant deterioration of air quality. This should be expanded since deterioration of the air quality in this region can drastically affect many national parks, monuments, and recreational areas as well as other scenic wonders which abound in the area.

Response: The discussion on air quality deterioration has been expanded in Chapters III and V of the FES.

(3) Comment: Should the Kaiparowits Power Project be approved, any proposed controls included in the impact statement should be implemented, considered binding, and not subject to future arbitration or bargaining.

Response: Refer to Chapter IV, Mitigating Measures, for a discussion of binding stipulations imposed upon the participants should the project be approved and constructed.

152. Dept. of the Interior Bureau of Mines

(1) Comment: Paragraph 3 (page VI6) should be revised to reflect correct usage of the word "productivity." Construction of the powerplant over a coal resource area will preclude recovery of the coal during the life of the project

but will not affect its productivity. Resources are not productive until they have been recovered.

Response: We agree with this comment, however, since it was received too late to be incorporated into the FES, the text was not revised.

(2) Comment: Of the seven lime/limestone processing alternatives listed in the environmental statement (page VIII-51), only six are discussed. The document should include a discussion of the seventh.

Response: Concur. This oversight was corrected in the FES before this comment was received.

(3) Comment: In light of the history of the controversy surrounding mercury and the environment, the concern about bioamplification in Lake Powell is understandable, but other than raising the issue of amplification of baseline levels, the environmental statement presents no data to support the contention (page III-154) that emissions from the Kaiparowits powerplant may contribute materially to increased mercury levels in the lake. Such a contention is deserving of quantification, insofar as is possible, using data provided in the environmental statement as follows:

Response: For an expanded discussion of bioamplification of mercury in the fish of Lake Powell, see Chapter III of the FES. Also additional pertinent references have been cited in Chapter III.

(4) Comment: Although "some fish" have been identified as carrying high levels of mercury (page III-154), the phrase is vague and indefinite and we are left with no means by which to judge the validity of the "data" used to support the concern for this environmental problem.

Response: See response to previous Comment No. 3.

(5) Comment: Two corrections need to be made on mercury data provided in the environmental statement. The standard deviation for mercury concentration data supplied by Arizona Public Service, and listed in figure 11 (page II-37), appears to be in error. The deviation is larger than the mean (0.06 ± 0.07). Figure 19 lists a mercury emission rate of 24 pounds per day. This rate is equivalent to a concentration of 0.40 ppm mercury, and is in error by one order of magnitude when compared to the trace element analysis of coal in figure 11, page II-37, and appendix III-5, figure 1, page A-614.

Response: The mean and standard deviation were based on analysis shown for coal of 0.16, 0.15, 0.005, 0.03, 0.02 and 0.04 ppm (Page II-83 of the Draft Statement). With the wide variability, the calculated standard deviation becomes larger than the mean. The mercury emission rate shown in Figure 19 should read 4 lbs. per day rather than 24. The error was corrected in the FES.

153. Dept. of Agriculture, Soil Conservation Service

(1) Comment: A sentence should be added to first paragraph stating that refrigerated cooling requires 5 to 10 times as many kwh as evaporative cooling.

Response: This information was received from the Arizona Public Service Company. Therefore, since it is part of the participants proposal, BLM is not at liberty to add or delete from such proposal.

(2) Comment: The EIS would be improved if units were given for the values listed under Ash Analysis.

Response: Concur. This change was made prior to receipt of this comment.

(3) Comment: Page I-85, line 18 Delete word "annual."

Response: A careful review of page I85 of the Draft Statement failed to locate the word "annual".

(4) Comment: Pages III-6, 2nd paragraph; III-120, 3rd paragraph; III-128, last paragraph; and VIII-223, 4th paragraph. There would be a decreased dilution of salts rather than a concentration. Also, the data on page VIII-223 should be coordinated with the similar data on the other pages listed above.

Response: Concur. "Salt concentration is in fact a result of decreased dillution. This is explained in Chapter III of the Final EIS. The term "salt concentration" and "salt loading" (increased salts) are commonly used by the the U.S. Bureau of Reclamation in discussing Colorado River salinity. Concur with comment regarding 4th paragraph Page VIII-223. However, this comment was received too late to be incorporated in the Final EIS. The U.S. Bureau of Reclamation estimates that withdrawal of 102,000 acre-feet per year of water from Lake Powell would increase Colorado River salinity at Imperial Dam by about 4 mg/l using the same assumptions for estimating to 2 mg/l increase (see Chapter III of the Final EIS).

(5) Comment: Page III-72, 1st line. Strontium is toxic only in large quantities when calcium and magnesium availabilities are low.

Response: We concur with this comment. However, it was received too late to be incorporated in the FES.

(6) Comment: Page III-78, last paragraph.

Change calcium flouride to "flourite."

Change last sentence as follows: High concentrations of gaseous flourides associated with smelter operations can be deposited on vegetation and cause fluorosis in animals when ingested with the food.

Response: Calcium flouride is a valid term for purposes of the statement. We concur with your recommendation for sentence revision. However, it was received too late to be incorporated in the FES.

- (7) Comment: Page III-202, line 9.

Nitrogen oxides rather than nitrates are emitted. However, the nitrogen oxides are subsequently converted to nitrates.

Response: Concur. The statement as written in the Draft EIS is misleading. The text has been corrected to reflect the fact that the nitrates are the result of conversion of nitrogen oxides.

- (8) Comment: Page VIII-222. Change last word from day to "year."

Response: Concur. This correction was made prior to receipt of this comment.

(9) Comment: We would recommend a detailed soil survey be made of the townsite if and when the project is approved to determine the soils limitations for various municipal uses.

Response: Your recommendation is valid. However, the townsite would pass to state and/or private ownership. If the transfer of title occurs, soil surveys would become the responsibility of state and county governments.

154. Dept. of Agriculture, Forest Service

(1) Comment: Page I-27, figure 10, should substitute "Coronado Station for Arizona Station" to reflect its new designation. Kaiparowits Project should be deleted since the Salt River Project has withdrawn.

Response: Concur. This correction was made prior to receipt of this comment.

(2) Comment: Page I-156, first sentence refers to something "described above," there is nothing above except a heading.

Response: The words "described above" should be deleted from the text; however, the comment was received too late to be incorporated into the FES.

(3) Comment: Page I-161, illustration 39 shows a proposed microwave site on Santiago Peak. Santiago Peak is shown in the wrong location. It is inside the Cleveland Forest boundary. On page I-166 (Figure 30) the table shows Santiago Peak as an "existing" microwave station with no expansion. This is not correct. There is room for other facilities. This needs to be clarified and the correct location shown.

Response: Concur. The text was revised based upon an earlier comment from the Cleveland National Forest.

(4) Comment: Page I-322, under section entitled "U.S. Forest Service would" add:

Grant communications sites - Act of June 4, 1897 (30 Stat. 35, as amended; 16 USC 551)

Grant special land use permits as necessary for access roads and marshallling yards - Act of June 4, 1897

Ensure compliance with laws and regulations applicable to National Forest System lands, such as the Archaeological Preservation Act and Endangered Species Act

Response: Concur. The additions were made before this comment was received.

(5) Comment: This same section brings up a point regarding the right-of-way needed across the Cleveland National Forest in California. The proposed right-of-way goes through two areas which were subsequently designated as inventoried roadless areas (Ladd and Coldwater Inventoried Roadless Areas). The

only place we could locate any mention of a roadless area on the Cleveland Forest is at the top of page II-311. Before the Forest Service could issue a permit or easement for a right-of-way, the environmental statement would have to address itself to the wilderness character of the roadless area. This could be done in the final EIS on Kaiparowits or in the Forest's Land Use Plan for the Trabuco District which is now in progress and scheduled for completion in 1976.

Response: Concur. However, this comment was received too late to be incorporated in the FES.

(6) Comment: As a result of the Stage I (EAR) report, the Forest issued a special use permit for surveying the proposed electric transmission line on July 15, 1971. The survey permit was for one year and was renewed on 12/7/72, 1/7/74 and 1/10/75. This is not a contractual commitment; therefore the question regarding the inventoried roadless areas needs to be expanded in the FES for this project. Our Regional office in San Francisco, California, will be available to provide input on this part of the final EIS. The final EIS needs to be clarified on two main points:

1. Historical land status and background on this route.
2. Physical, social and economic impacts on the inventoried roadless areas.

Response: Although this information would have been useful, it was received too late to be incorporated in the FES.

(7) Comment: Page II-364 (Illustration 58), the Four Corners Region now covers all counties in the four States.

Response: Concur. However, this comment was received too late to be incorporated in the FES.

(8) Comment: Page III-329, third paragraph states, "the Central Arizona Project is constantly striving to meet water demands of Phoenix area residents,

and to date the project has been most successful." We believe the writer meant something other than the CAP.

Response: The CAP will provide water to the Phoenix area in the future. At present, the Salt River Project provides water to the Phoenix area. This change was not incorporated in the FES because the comment was received too late for text revision.

(9) Comment: Page IV-44, it is suggested that the wording be altered to either indicate that the project can be accomplished with no damage to Threatened and Endangered Species or a mitigation plan should be developed for any damage proposed.

Response: This reference to threatened or endangered species is part of the section, "Measures to be implemented by the applicants," the introductory paragraph of which reads,

"The following measures proposed by the participants are general rather than specific and do not specify locations or methods for accomplishment. Therefore, given this limited information, the potential effects and the degree of success of these measures can not be evaluated."

On pages IV 68 - 70 (draft), Measures proposed by Federal agencies, several right-of-way requirements are proposed by the Bureau of Land Management for protection of endangered or threatened species. However, in many cases, specific mitigation plans would be possible only after more site specific studies had been completed.

(10) Comment: Page IV-47 (#37), the discussion of water removal from natural stream courses during the construction phases should be more specific indicating removal amounts authorized and for what purposes.

Response: This type of information is not presently available at this time. Specific stipulations and authorizations would be made after specific water sources for construction have been identified.

(11) Comment: Page IV-59, it is suggested that stream protection zones be delineated where water and wildlife resource values exist and that no spoil disposal be permitted within these zones.

Response: Waste or spoils resulting from construction would have to be disposed of under guidelines and stipulations of the agency administering the land and related resources. Those guidelines and stipulations are designed to protect the land related resources including water and wildlife.

(12) Comment: While the direct impact to forests in our California Region involves only 7.9 miles of transmission line, the one weakness we note in the draft EIS is that it fails to note if the proposed route is the most feasible route. The alternate routes investigated should be assessed and the preferred route recommended. Assessments should be made of both the recommended route and the proposed route if they should differ.

Response: Your concern is valid, however, the purpose of an environmental impact statement does not include making recommendations. The participants proposed certain transmission line routes and offered alternative routes. In addition, BLM considered other alternate routes. All routes have been objectively assessed in the EIS so that the reader may decide which route or routes may be the most favorable from an environmental standpoint.

(13) Comment: The proposed 500 kV AC transmission line system could limit our management options on R/W locations currently being considered. Some of these projects include the Intermountain Power Project, Allen Warner Project,

Victorville-Rinaldi Project and the San Joaquin Nuclear Power Project. We realize that the energy intertie system in the Western U.S. is very complex. However, this is further complicated by the varied energy forecasting methods used by the utility companies as discussed in A-712-738 of the reference material. These varied forecasting techniques may tend to double-count the same people in Southern California. The key issue is that these projections call for an unacceptable number of additional transmission lines through the Angeles National Forest over the next 20 years. We need to be able to look at what is happening now so we can plan and manage the possible impacts in the future.

Response: While a comprehensive study of future energy needs in the West would be valuable, the time frame for completing such a study would not have allowed its inclusion in the Final Kaiparowits EIS.

(14) Comment: There should be a thorough discussion of the feasible alternatives. For example, in the discussion of alternate transmission systems, we note on pages 200-201 of Chapter VIII that one 600 kV dc line (which replaces 2-500 kV ac lines) has half the environmental impact and less visual impact. In addition the report states that one 765 kV ac line (which replaces 2-500 kV ac lines has half the environmental impact, but greater visual impact.

Response: All feasible alternatives have been discussed in Chapter VIII. With respect to 600 kV dc versus 765 kV ac, visual impacts resulting from the latter would be greater. The 765 kV dc alternate would require the largest and most obvious towers.

155. Federal Energy Administration

(1) Comment: It is important that, to the extent possible, cumulative impacts and interrelationships with other projects be discussed. This is necessary

not only for assuring adequate consideration of environmental and resource factors, such as air quality and water usage, but also for assuring that further energy developments in the area can be accommodated.

Response: See response to Rudolph's Comment No. 7 and Janke's Comment No. 2. The potential cumulative air quality impacts dealing with interaction of the Navajo plant and Kaiparowits are discussed in Chapter VI of the FES. Also, see Interrelationships in Chapter I.

(2) Comment: In addition, given the scarcity of water and the competing uses for it in terms of energy development, can more beneficial uses of the water supply be defined?

Response: The discussion on alternate uses of water in Chapter VIII has been expanded in the FES.

(3) Comment: Although the EIS lists the competing uses for the water in terms of powerplants (coal-fired), oil shale, thermal electric generation, coal gasification, and tar sand development, it makes no attempt to consider how the water can best be used to supply the nation's energy requirements.

Response: See response to Rudolph's Comment No. 7 and Janke's Comments No. 2.

(4) Comment: The draft EIS states that the withdrawal of 50,000 acre feet of water a year from Lake Powell for consumption use by the proposed plant would reduce Utah's remaining allocation of Colorado River water by about 3.8 percent. It is unclear how this percentage was derived. According to figure 56 on page I-354, the remaining water available to Utah was 497,000 acre feet. The use of 50,000 acre feet annually would therefore represent approximately 10 percent of the remaining water available to the State as of 1974. It is recommended that this be clarified in the final EIS.

Response: Concur. This issue was clarified in the FES.

(5) Comment: The question of increased salinity in the Lower Colorado River should be more fully addressed. On page III-6, it is estimated that approximately \$230,000 per year in damages to agricultural, municipal, and industrial users on the Lower Colorado River will occur for each milligram-per-liter of increase in the river salinity. Equating this in terms of the Kaiparowits proposal indicates a loss of \$483,000 per year, or a total of \$16,905,000 over the 35 years of the project. To the extent possible, a more complete picture of potential salinity problems should be presented including a discussion of possible energy requirements for desalinization plants if required.

Response: The discussion of increased salinity in the Lower Colorado River has been expanded in Chapter III of the FES.

(6) Comment: The EIS does not treat the combined effects of air quality impacts by Kaiparowits and the existing or firmly proposed powerplants in the area. Combined effects on visibility as well as the potential for additive impacts upon other air quality parameters should be considered more fully. It is stated in Chapter II of the EIS that air quality impacts from the Navajo plant have been measured but are not yet available. Why are measurements taken in 1974 not now available for an analysis of the Kaiparowits project? Furthermore, in the absence of air quality measurements to determine cumulative impacts, cannot modeling techniques be used to predict the combined impact of these two plants?

Response: Air quality impacts, modeling techniques and visibility discussions have been expanded in Chapters III and V of the FES. The interaction of the Navajo plant and Kaiparowits is discussed in Chapter VI. Also, see responses to Rudolph's Comment No. 7 and Janke's Comment No. 2.

(7) Comment: The EIS does not substantively discuss the potential implications of significant deterioration requirements on the Kaiparowits project.

The decision stated on the errata sheet for Chapter I to discuss these implications only in the event that the national park areas are designated as Class I is inadequate.

It is possible that in the future the national park areas in the neighborhood of Kaiparowits could be designated as Class I areas. Therefore, the final EIS should contain a quantitative analysis of the implications for the Kaiparowits project if neighboring national parks are legislatively designed Class I.

Response: The discussions concerning significant air deterioration of the National Parks have been expanded in Chapters III and V of the FES.

Participants' comments and responses

During the public review period, the participants submitted a 250-page document containing approximately 800 separate comments on the Draft Environmental Impact Statement. Because of the large number of comments and the corresponding responses, the comments were not reproduced in the Final Statement. However, all comments by the participants were reviewed by the Bureau of Land Management staff analysts and corrections were made in the Final Statement, where appropriate. Individual responses were prepared for each comment. The comments and responses are available for public review at the following offices of the Bureau of Land Management: Utah State Office, Salt Lake City, Utah; Cedar City District Office, Cedar City, Utah; Paria Resource Area Office, Kanab, Utah; California State Office, Sacramento, California; Riverside District Office, Riverside, California; Arizona State Office, Phoenix, Arizona; Nevada State Office, Reno, Nevada; and Las Vegas District Office, Las Vegas, Nevada.

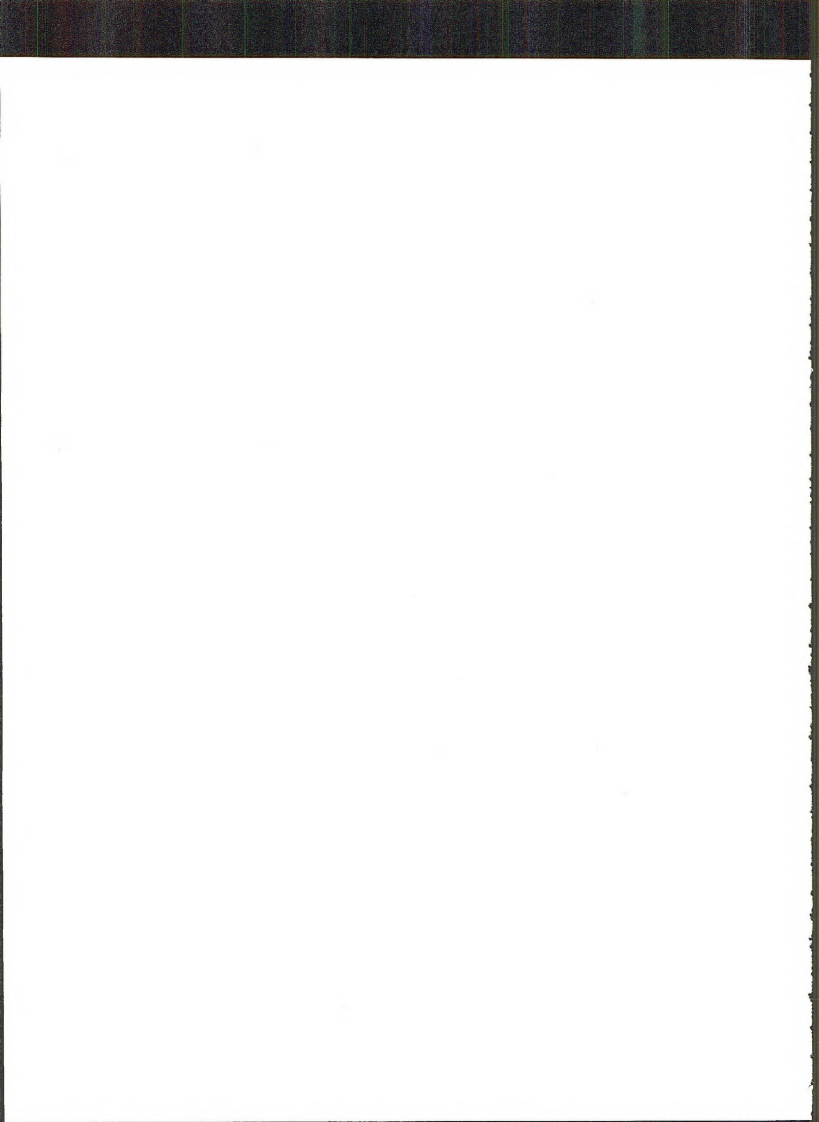


Exhibit A

Comment letters in chronological order

the 1990s, the number of people in the UK who are aged 65 and over has increased by 1.5 million, and the number of people aged 75 and over has increased by 1.1 million (Office of National Statistics 1999). The number of people aged 85 and over has increased by 0.5 million.

There is a growing awareness of the need to develop services to meet the needs of the ageing population. The Department of Health (1999) has published a strategy for ageing, which sets out the government's commitment to improve the lives of older people. The strategy is based on the following principles: older people should be able to live independently, safely and comfortably; older people should be able to participate in the community; and older people should be able to access the services they need.

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August 4, 1975

STATE OF UTAH
Calvin L. Hampton, Governor
DEPARTMENT OF
DEVELOPMENT SERVICES

Melvin T. Smith, Director
603 East South Temple
Salt Lake City, Utah 84102
Telephone: (801) 328-5755

Mr. Paul Howard
State Director
Bureau of Land Management
Federal Building
Salt Lake City, UT 84111

Dear Paul,

The following are my comments on the Kaiparowits Draft Environmental Impact Statement:

- 1) It is my impression that the purpose of impact statements is to provide a study of alternatives. Needs and impacts of these alternatives can then be assessed and a choice made as to which alternative would be best. However, the archeological studies conducted as a part of this statement do not adequately discuss alternatives.
 - a) Only 10 percent of the impact area was studied; the plant site survey is "not complete;" "most" of the transmission corridors were not surveyed. Given this limited data, it is virtually impossible to adequately assess alternatives, particularly alternate transmission corridors.
 - b) In the absence of data, so-called "probability models" are provided. These are inadequate in my estimation for making any final decisions.
- 2) It is stressed that both direct and indirect impacts on cultural resources will be very high. I must agree. However, the measures that will be taken to mitigate these impacts are unclear. Mitigation measures are not detailed, probably because probable impacts were not adequately studied. While areas of direct impact will be surveyed and sites identified for avoidance or salvage if necessary, mitigating measures for secondary impacts are not discussed. We mitigating measures are proposed by participants and it is unclear whether federal agencies' proposed mitigating measures will be accomplished prior to turning control over to participants.
- 3) I feel that the Kaiparowits project will eventually be used as a guide for numerous other similar projects in Utah, and as such I am being somewhat critical. I am aware that much detailed

August 4, 1975
Mr. Paul Howard
page 2

work, particularly archeological research, has gone into the preparation of this statement. However, I feel it is inadequate for the assessment of possible damage to archeological sites. Above all I am concerned with the secondary impacts. There is enough legislation presently to assure that direct impacts on cultural resources will be adequately handled. However, the newly opened access route to previously inaccessible areas and the influx of workers and visitors will result in the destruction of literally thousands of archeological sites in the project area. I suggest that in the final statement measures to identify resources in secondary impact areas and measures to protect these resources be discussed.

Sincerely,

and B. Madson

DAVID B. MADSEN
State Archeologist

DBM:lg

cc: State Historic Preservation Officer

17-11



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
ENVIRONMENTAL RESEARCH LABORATORIES

2

August 7, 1975

R32

Mr. Paul Howard
State Director, Bureau of Land Management
U.S. Department of Interior
P.O. Box 11505
Salt Lake City, Utah 84111

Ref: 2850
(U-913)
(Kaiparowits)

Dear Mr. Howard:

Thank you for your letter of July 14, 1975 giving us the opportunity to review the air quality section of the Draft Environmental Impact Statement for the Kaiparowits Power Plant.

Attached are comments which I hope you will find useful in preparing the final version of the report.

Sincerely,

Isaac Van der Hoven

Isaac Van der Hoven
Air Resources Laboratories

cc/with attach.

Dr. W. Wagner, BLM

8th-XI

2

Comments on

Draft Environmental Impact Statement for the
Kaiparowits Power Plant

Prepared by

Air Resources Laboratories
National Oceanic and Atmospheric Administration
August 8, 1975

p. II-29, lines 14-15

The term "air pollution potential" is usually considered to be an appropriate meteorological measurement such as the criteria for "stagnation conditions". We would suggest omission of the phrase "can be interpreted as an air pollution potential and".

p. II-30, line 5

Unofficially, influence of the Navajo Plant is known as a result of the 1974-75 fall and winter SO₂ measurement program. Highest 3-hr. concentrations were found on Vermillion Cliffs and Leché Rock, although these did not exceed standards when prorated to the eventual operation of 3 units. Nevertheless, it does indicate the importance of the interaction (impingement?) of the plume and high terrain. We would suggest contact with the Navajo Plant operators (Salt River Project) to obtain their results.

p. II-43, 10th line from bottom

Reference should be 1972.

p. III-21, Section 3

On what basis (visible tracer, quantitative plume concentration measurements?) was it concluded that the plume cleared the Straight Cliffs? From the Vermillion Cliffs results we would conclude differently.

p. III-23, Suggest use of metric system throughout table.

p. III-38, line 9

typo - mechanical-draft.

p. VIII-248, line 9 from bottom

-15°F

3

FEDERAL ENERGY ADMINISTRATION
WASHINGTON, D.C. 20461

AUG 8 1975

Mr. Paul L. Howard, State Director
United States Department of the Interior
Bureau of Land Management
Post Office Box No. 11505
Salt Lake City, Utah 84111

Dear Mr. Howard:

Please refer to your letter, dated July 29, 1975, to the Office of Oil and Gas, requesting comments on the draft Environmental Impact Statement on the proposed Kaiparowits Power Project.

The Office of Oil and Gas has been transferred from the Department of the Interior to the Federal Energy Administration (FEA). FEA is not listed in the subject Environmental Impact Statement as one of the Federal agencies from which action is required, and we are not certain that you intended to request our comments.

The Office of Oil and Gas is transferring the nine chapter Kaiparowits Environmental Impact Statement to FEA's office of Energy Conservation and Environment, Director of Environmental Impact. We suggest you contact that office directly if you desire further action from FEA on this matter.

Sincerely,

James R. Gill
James R. Gill
Associate Assistant Administrator
Office of Oil and Gas

cc: Director of Environmental Impact
Energy Conservation and Environment

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
CLEVELAND NATIONAL FOREST
3211 Fifth Ave.
San Diego, CA 92103

4

REPLY TO: 8400 - ENVIRONMENTAL STATEMENTS

August 18, 1975

SUBJECT: Kaiparowits Project

TO: Mr. Bill Collins
Bureau of Land Management
1695 Spruce Street
Riverside, CA 92507



I have given the above document a look and examined the part relevant to the Cleveland National Forest. There is only a minor discrepancy which should be corrected in the Final Environmental Statement.

Illustration 39 (Page I-161) shows a proposed microwave site on Santiago Peak (Santiago Peak is shown in the wrong location - it is inside in Cleveland Forest Boundary). However, on Page I-166 (Figure 30) the table shows Santiago Peak as an "existing microwave station, no expansion." Needs to be clarified and the correct location shown.

I assume the September 19th meeting is still on - I plan to attend.

John L. Karagozian
JOHN L. KARAGOZIAN
Lands Officer

644-X1

August 21, 1975

Mr. Paul L. Howard
State Director
Utah State Office
Bureau of Land Management
U.S. Department of the Interior
125 South State Street
Salt Lake City, UT 84111

Dear Mr. Howard:



GOVERNOR'S COMMISSION ON ARIZONA ENVIRONMENT 206 S. 17 Ave. Phoenix Arizona 85007 261-7803 or 261-7804

Thank you for sending us the draft environmental impact statement on the proposed Kaiparowits Power Project for comment.

It would be helpful when comment is desired from commission-type organizations to have draft statements more than 60 days before the cut-off date, especially when such statements run in the area of 1,500 pages. Commissions work slowly and methodically, so it is impossible to get a consensus in this short a time.

My own personal opinion is that the study is well done, in considerable depth and of wide scope.

The use of helicopters to install towers is highly commendable. The necessity for access roads for all towers is questionable. Use of tracked vehicles could eliminate many such roads (see information on Tucson Gas & Electric line from Farmington, New Mexico to Vail, Arizona). Restoration is simplified if impact is eliminated or reduced greatly.

Perhaps the YCAE Construction Manual could be adopted by the applicants.

Yours sincerely,

GOVERNOR'S COMMISSION ON ARIZONA ENVIRONMENT

E. J. MacDonald
E. J. MacDonald
Chairman

FJM:jfg

IX-450



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

REGION EIGHT

Utah Division
P.O. Box 11563
Salt Lake City, UT 84147

September 10, 1975

IN REPLY REFER TO:

08-49.21

Mr. Paul L. Howard
State Director
Bureau of Land Management
P.O. Box 11505
Salt Lake City, Utah 84111

Dear Mr. Howard:

Subject: Environmental Impact Statement
Kaiparowits Project, 2850 (U 933)

By our memorandum of May 20, 1975, we commented on the draft summary of the above EIS. Our concern was that material available at that time did not adequately address the environmental impacts of the access road.

We have now reviewed the draft environmental impact statement and have discussed with you the items which we believe will still need to be included to meet NEPA requirements.

On September 2, 1975, we met with you and your staff along with representatives of the Utah Division of Transportation. A Follow-up meeting was held with your staff on September 8, 1975, to discuss the general areas where we believe additional coverage is necessary.

The areas of concern are as follows as they apply specifically to the access highways.

Air Quality
Noise
Water Quality
Historical and Archeological Sites
Section 4(f) or Park and Recreation Lands

Your staff suggested that Bureau of Land Management guidelines for EIS coverage of some of the above items may be deficient as applicable to highway concerns, and requested copies of Federal Highway Administration guidelines. Available material was given to Mr. Wagner after the meeting.

-more-

We will be pleased to discuss further with you the recommendations we have made and will work with you to help assure that the requirements of NEPA are met in the final EIS.

Sincerely yours,

George W. Bohn
For George W. Bohn
Division Administrator

IX-451

September 11, 1975

Mr. Paul Howard, Utah State Director
Bureau of Land Management
125 S. State St.
Salt Lake City, Utah 84111

Dear Mr. Howard:

There are alternatives to the location for the projected Kaiparowits Power Project, in fact, to the construction of the plant itself.

Construction of such plants could be done off-shore in the ocean with minimal damage to the ocean environment compared to damage on land.

Since it is California and Arizona that want the power, construction should be done in those states and let them bear the consequences. This would cause them to think more seriously about conservation of energy.

There should be more decentralization of power plants instead of such massive centralization as the Kaiparowits plant represents.

As regards environmental degradation, hardly any place could have been more ill-chosen than a spot within 200 miles of 1/5 of the total National Park System's lands! As a taxpayer, I resent this colossal disregard of our public preserves and overwhelming the public domain with a single-interest project.

There is also the very viable alternative of inventing effective energy conservation in the areas the Kaiparowits plant will serve. To date, energy conservation seems to be only a last ditch stand.

Former Secretary Morton rejected the application for Kaiparowits, and the BLM DEIS cites significant damaging impact to the water supply, air quality, scenic quality, wildlife survival plus sociological and population problems. Certainly there is a message here that should be heard.

The Kaiparowits project will degrade every beneficial, vital, attractive characteristic of the area within a radius of 200 miles. As a result, the economic benefits Utah enjoys from the tourist trade will be cut back in direct proportion to the adverse effects on the natural attractions of the region.

Please enter this letter in the hearing record.

Sincerely yours,

Dorothy Gumaer, Coordinator
Southeastern Colorado Wilderness Coalition

cc. Senator Maskell
Representative Mr. Armstrong



Arvin W. Roos, Chairman
SIERRA CLUB
NORTH DAKOTA GROUP
Box 355, Steele, N.D. 58402

September 7, 1975

Mr. Paul Howard, State Director
Bureau of Land Management
125 South State St.
Salt Lake City, Utah 84111

Dear Mr. Howard:

I respectfully request that this letter be admitted as one of the written comments on the 3000 Megawatt Kaiparowits Power Generating Project Environmental Impact Statement.

Even though I live far away, I speak for myself and the North Dakota Group of the Sierra Club when I say: "We are vitally concerned that the air, open space, national parks and monuments, and recreational areas of the Southwest be preserved from degradation and deterioration."

The massive size of the proposed Kaiparowits Power Generating Project poses a serious threat to the whole nature of the environment in the Southwest. If and when (God forbid) those huge generating plants were built, several of them west of national parks, the air, land, open space and remote nature of each will rapidly deteriorate. Harry Allen plant, west of Grand Canyon; Warner Valley plant, west of Zion National Park; Garfield and Kaiparowits, west of Capitol Reef, Canyonlands, and Arches National Parks, are "upwind" meaning the prevailing westerlies will surely carry the smoke over them to befoul the air. Mines, roads, industries, as everyone knows, forever alter the whole nature of an area.

It should not be necessary to spell out in detail all the disadvantages. The E.I.S. itself has done that - mentioning "haze & sky discoloration" ... "transmission system creating a 'major intrusion into otherwise natural landscapes,'" etc.

Secretary Morton, when head of the Dept. of Interior, rejected the Kaiparowits project, and he is a solid Republican! Why keep harping at it and pushing it, when all reason and common sense militates against it! It can only be greed & folly which would cause men to build it.

There are alternatives. Either let southern California learn to conserve energy, burn coal near where the electricity is used - or better still, develop solar energy, of which there is an abundance in that part of the world.

Speaking with conservation-minded people nationwide, I emphatically urge the permanent shelving of the Kaiparowits Power Generating Project.



Sincerely, *Arvin W. Roos*
Arvin W. Roos, Chairman
N.D. Group, Sierra Club

IX-452

New Mexico



WILDERNESS STUDY COMMITTEE

SEPT. 10, 1975

MR. PAUL L. HOWARD
STATE DIRECTOR BLM
SALT LAKE, UTAH 84111

GENTLEMEN: (FOR THE RECORD, PLEASE)

WE FEEL THAT THE ADDITION OF THE
Kaiparowits Power Project IS A MISTAKE.

IT AND ALL OTHER SIMILAR PLANTS
PLANNED IN THE VICINITY REPRESENT
SHORT-SIGHTED ANALYSES. ELECTRICAL
TRANSMISSION LOSSES TO THE POPULATION
CENTERS, COUPLED WITH THE ENVIRONMENTAL
LOSSES ARE BOTH OVERWHELMING NEGATIVE
FACTORS.

THOSE COAL FEEDSTOCKS, PERHAPS CONVERTED
IN SITU, ARE FAR MORE VALUABLE* NATIONAL
RESOURCES FOR THE FUTURE. SINCERELY, *G. McDonald*
*CHEMICALLY G. CORY MC DONALD
CHAIRMAN



10

11

Advisory Council
On Historic Preservation
1522 K Street N.W.
Washington, D.C. 20005

September 12, 1975

Mr. Paul L. Howard
State Director
Utah State Office
Bureau of Land Management
P. O. Box 11505
Salt Lake City, Utah 84111

Dear Mr. Howard:

This is in response to your request of July 29, 1975, for comments on the draft environmental statement (DES) for the Kaiparowits Power Project in Utah, Arizona, Nevada and California. Pursuant to its responsibilities under Section 102(2)(C) of the National Environmental Policy Act of 1969, the Advisory Council on Historic Preservation has determined that your DES is inadequate regarding our area of expertise as it does not demonstrate compliance with Section 106 of the National Historic Preservation Act of 1966 or Sections 1(3) and 2(b) of Executive Order 11593, "Protection and Enhancement of the Cultural Environment" of May 13, 1971, as implemented through the Advisory Council's "Procedures for the Protection of Historic and Cultural Properties" (36 C.F.R. Part 800).

However, we note on page III-199 of the DES that Bureau of Land Management (BLM) has determined that the proposal will adversely affect cultural resources and that BLM proposes to enter into a Memorandum of Agreement with the Advisory Council "as required by 36 C.F.R. Part 800." Therefore it appears that BLM proposes to obtain the comments of the Council pursuant to Section 106 and the Executive Order. The Advisory Council looks forward to receiving BLM's request for comments on the undertaking pursuant to the procedures.

Should you have any questions or require additional assistance, please contact Brit Allan Storey of the Advisory Council staff at P. O. Box 25085, Denver, Colorado 80225, telephone number (303) 234-4946.

Sincerely yours,

Louis S. Wall
Assistant Director, Office
of Review and Compliance

The Council is an independent unit of the Executive Branch of the Federal Government charged by the Act of October 15, 1966 to advise the President and Congress in the field of Historic Preservation.

IX-453

VERLIS L. FISCHER
1511 HOUNSDELL AVENUE
LAS VEGAS, NEVADA 89102

September 15, 1975

Mr. Paul Howard, State Director
Bureau of Land Management
125 State Street
Salt Lake City, Utah 84111

Subject: Kaiparowits Project

Dear Mr. Howard:

I represent the Wyoming-Utah-Nevada chapter of Outdoors Unlimited, a citizen's conservation organization with eleven chapters in the western states. We are interested in and actively promote the wise use and sound management of our natural resources, and believe that multiple use of our public lands offers the best combination of public benefits - both economic and social.

The subject of the proposed Kaiparowits power project occupied a prominent place on the agenda of our last board of Directors meeting August 26 in Rock Springs, Wyoming, and by unanimous action of all Directors present voted to endorse and support the proposed project. The only qualifying item expressed at our meeting had to do with the water supply for the project. Virtually all of the power to be produced is scheduled for use in Arizona and California, but the water consumed is to be taken from Utah's allocation of Colorado River water. Since Arizona and California are to be the principal beneficiaries of the electric power, why should not the water consumed in the actual power production be drawn from those state's allocations rather than Utah's?

We thank you for this opportunity to express our views, and kindly request that this statement be made part of the public hearing record.

Sincerely yours,

Verlis L. Fischer
Verlis L. Fischer, Director
Wyoming-Utah-Nevada Chapter
Outdoors Unlimited.

cc: Mrs. Roberta Fullerton, President
WUN Chapter, Outdoors Unlimited
Box 191
Laramie, Wyoming 82070

The Utah Manufacturers Association endorses the proposed Kaiparowits Power Project for Kane County, Utah. In doing so, it also supports the Nipple Bench site as the best from the standpoint of economy of construction and operation and environmental considerations.

As the voice of some five hundred members, individuals and other establishments who believe that Utah's prosperity and progress depends, to a large measure, on the development of our natural resources and converting these resources into manufactured products in Utah factories and industrial plants, by Utah workmen, for both home and export sale, we strongly urge the early approval of this project for the following reasons:

1. Utah relies heavily on goods produced in many parts of the nation: automobiles from Michigan; citrus fruits and vegetables from California and Arizona; wheat and lumber from the northwest; cotton from the south; and oil from many states, as prime but not sole examples. To offset these imports we must export to others our raw materials and manufactured products. The interdependency of these economies is an important way of our life.
2. In a real sense the mining of our ores and the extraction of our metals and minerals in manufacturing and is beneficial to the people of Utah, but a combination of raw resource extraction and processing them with Utah labor in Utah factories and industrial plants will bring maximum benefits to all the people of Utah.

These are among the benefits which the coal-fired Kaiparowits electrical generating plant will bring to Southern Utah and to the State as a whole:

- ...3,000 direct employees of Kaiparowits will find new jobs in mines and power plants;
- ...5,000 to 6,000 additional workers will be needed to support the service industries which will be needed;
- ...utilizing the current tax rate, annual property tax revenues attributable to the project are expected to equal nearly \$30 million dollars by 1986 for the erection and maintenance of schools, highways, hospitals, police and fire protection, welfare and other needs;
- ...over \$100 million annually to the payrolls of Kane County;
- ...an increase in retail sales of \$70 to \$75 million;
- ...nearly \$30 million in new revenues from property taxes directly related to the project for the building and maintenance of schools, highways, hospitals, public welfare, police protection and other services and facilities.

In addition, annual tax revenues totalling some \$32 million (excluding Property Tax Revenues) are expected from Federal and State income, State corporate and State and local sales taxes.

The use of Utah coal resources for the generation of electricity will also help our nation to achieve energy-independence by using domestic coal as a replacement for annual imports of 33 million barrels of foreign oil now required to produce the equivalent amount of electricity which Kaiparowits can produce from coal.

IX-455

RETURN TO
Utah Manufacturers Association
 SUITE 425-426 KAGANE BUILDING
 136 SOUTH MAIN STREET
 SALT LAKE CITY, UTAH 84101

All this can be accomplished, we believe, with no significant adverse impact on our air quality or scenic beauty.

Presented by

Robert Halladay

Executive Vice President

Utah Manufacturers Association

Kearns Building, Salt Lake City, Utah

OPERATING ENGINEERS LOCAL UNION NO. 3

OF THE
INTERNATIONAL UNION OF OPERATING ENGINEERS
AFFILIATED WITH THE AFL-CIO

Jurisdiction
Northern California, Northern Nevada,
Utah, Hawaii and Mid-Pacific Islands



Telephone 431-1568
474 Valencia Street
San Francisco, California 94103

1958 West North Temple
Salt Lake City, Utah 84116

September 18, 1975

State Director
Bureau of Land Management
P.O. Box 11505
Salt Lake City, Utah 84111

Dear Sir:

Please find enclosed the text of my oral statement to be made
part of the official record on the Kaiparowits hearing.

Very truly yours,

Vance Abbott

Vance Abbott
Safety Representative

Enc.

VA/jj
opeiu-31
af1-c10

14

14

My name is Vance Abbott. I live in Spanish Fork, Utah.

*I am a representative of Local Union #3 of the International
Union of Operating Engineers.*

*I do not intend to quote statistics or technical data. I
do wish to express my feelings and those of the members of my
local union as well as the vast majority of residents of the
state of Utah concerning the Kaiparowits project.*

*The Operating Engineers Local Union #3 has approximately
36,000 in our jurisdiction; 3,300 living and working in this state
who depend on the construction industry for their livelihood.*

*This industry is very depressed at the present time and
extremely so in the southern section making it necessary for many
of our members to give up their homes and seek employment elsewhere.*

*This is a sad situation which would be remedied were this
project to begin.*

*We, of the Operating Engineers, do not and never have condoned
the wanton destruction of our natural ecology or the unchecked
deterioration of our environment.*

*We do feel there is a reasonable balance to be reached
between the environment and industrial-social progress. We
realize some environmental sacrifices must be accepted to gain
economic and social growth.*

*We feel the preliminary environmental impact study is thorough
and adequate and that the benefits of the project far outweigh
the detriments affecting the majority of the public.*

*Enough time and tax dollars, as well as private funds, have
been used in the area of studies and hearings. The time is now
to proceed with the actual development.*

1X-457

There are adequate standards and guidelines set forth and coupled with enforcement to ensure that this plant will be constructed to maintain emissions levels within acceptable limits and the developer has no intention of doing otherwise.

It is not likely the initial installation will endure the projected life expectancy of the coal supply available without major alterations, repairs and replacements. Thereafter, as technology introduces new and better methods, economically feasible to control the emissions, they can and will be incorporated into this plant, as well as in many others in existence, and in those being proposed.

My ancestors were among the first to come to the Territory of Deseret and were with the first group sent to colonize this region of Utah, Nevada and Arizona. In researching memoirs and autobiographies of these hardy pioneers, I find their objective was to till the land and make it productive, inhabit it and also find and develop the natural resources for the use and benefit of mankind; not to hoard it and let it go to waste. The development of this much-needed source of energy to benefit this majority is in keeping with this philosophy.

The question might be raised concerning adverse social impact on local communities as a result of the influx of construction people. To this I say: the resourcefulness, integrity and dedication which characterized their forefathers is still prevalent in these people today and I am confident these challenges will be met and solved on local, state and regional levels, as they should be.

Residents of this area should have the authoritative voice in determining their joint destiny as concerns this area of development. I cannot see any time in the future when the adverse impact of this project on the resident populace of the affected area would be less than at the present time or the benefits derived would be any greater.

Any further studies or delays will only increase the cost of construction to a near-prohibitive level.

Therefore, we request all future unnecessary delays be suspended and allow this proposed development to become a reality at the earliest possible time. Thank you.



16

City of Banning

CALIFORNIA

161 WEST RANNEY STREET TELEPHONE 649-4511

Office of City Manager

September 17, 1975

Bureau of Land Management
State Director, Utah State Office
125 South State Street
Salt Lake City, Utah 84111

Re: Kaiparowits Power Project

Gentlemen:

We here in the community of Banning have been reviewing the proposed location of transmission lines from the Kaiparowits Power Project through the San Geronimo Pass with some concern. This letter is just one of many that you will receive with respect to the transmission lines.

Banning's Airport Advisory Commission at their regular meeting of September 16, 1975, wants to go on record as being concerned as to the power placements for this transmission line.

The commission would like for you and other Federal Agencies to control the placement of these tower structures so that they do not jeopardize air traffic in the San Geronimo Pass and access to the Banning Airport.

We suggest that a cooperative effort be made with other Federal Regulatory Agencies in the development of this transmission line.

Sincerely yours,


David F. Dixon
City Manager

BFD/c
cc: F.A.A.
Los Angeles Office

IX-459

UTAH MINING ASSOCIATION

INCORPORATED

KEARNEY BUILDING
SALT LAKE CITY, UTAH 84101
TELEPHONE (801) 364-1874

ERIC G. RYDER
PRESIDENT
R. S. SMITH
VICE PRESIDENT
JOSEPH C. BENNETT
VICE PRESIDENT
BRIAN C. MCARTHUR
VICE PRESIDENT

PAUL S. RATTLE
HANSER

September 18, 1975

Mr. Paul L. Howard, State Director
Bureau of Land Management
P. O. Box 11505
Salt Lake City, Utah 84111

Dear Paul:

This is to acknowledge and thank you for sending us a copy of the draft Environmental Impact Statement on the Kaiparowitz Project -- all five volumes and 2700 pages of it. You have asked for comments on this proposition, hence this letter. First, on the EIS document itself:

Few informed people in today's society would quarrel with the concept that something in the nature of an EIS is desirable for major projects undertaken, supported or facilitated by government. On the other hand, any such major project can, in the absolute sense, involve endless impacts of a scope and detail that boggle the mind and are beyond human ability to fully identify, quantify and accurately assess. However, the major impacts and relationships involved in a large project will usually be subject to an assessment that can be understood and accepted by the majority of the people concerned. Such assessment should be useful to a wide variety of decision makers, public and private, in arriving at courses of action to be taken. The Kaiparowitz statement fails miserably to fit this concept. Apparently quality has been sacrificed for quantity, with a resultant major waste of human, physical and economic resources. We appreciate that this state of affairs is not entirely of the BLM's making, considering the misplaced pressures, constraints, and complexity inherent to the issue. But, somehow a point must be reached where a quality EIS can be prepared on a project in a timely manner that will lead to a balanced understanding of its probable impacts and benefits -- a statement that can be read and digested in a single sitting. Failure in this regard can result in enormous waste and ultimate collapse of the entire impact review process. In the case of Kaiparowitz, the subject has been studied almost to death, seemingly without throwing a balanced light on the issue. Approval is long past due. Now for some specifics:

This Association has long favored the development of coal in Southern Utah, thus contributing to the establishment of a balance in satisfying the region's energy demands. We believe that the long proposed Kaiparowitz project is a well developed and sensible plan in this direction and should have been finally approved years ago. The reasons for this support are well documented and concurred in by the informed majority in the region, and whose welfare and wishes should be primary in this matter. Among these many reasons are the following:

Mr. Paul L. Howard, State Director
Bureau of Land Management
September 18, 1975
Page 2

1. Additional energy supplies are mandatory for the Southwest. Additional coal-based electrical energy will be needed by current populations to reduce imports of oil and permit realignment of scarce natural gas to more advantageous use. Additional energy is needed to support opportunities for disadvantaged persons in the region, and this in itself will increase energy demand as their standards of living improve. More energy is needed to improve or maintain a desirable quality of life through pollution control and many other energy-intensive efforts.
2. The population of Utah is concentrated along the narrow band known as the "Wasatch Front" and is growing rapidly. Populations in other areas of the State tend to remain stable or shrink, largely due to lack of employment opportunities. It has been long recognized that the development of all of the state on a balanced basis -- as opposed to Wasatch Front concentration -- should be in the best long-term interests of the State. The Kaiparowitz project fits this concept. It is near the geographic center of a region known as the Four Corners Area, which, because of its depressed condition, has been the focus of the federal and multi-state "Four Corners Commission", a costly governmental function aimed at generating economic growth and opportunity in the region.
3. The population of the Southwest region as a whole is destined to grow -- perhaps dramatically -- thus intensifying energy demand. Indeed, the ultimate limiting factor to growth of the region may be a combination of water and energy supplies.

This Association, in supporting the Kaiparowitz project -- and possibly others that may be proposed for the future in Central and Southern Utah -- wishes to draw attention to the question of water. The State of Utah has an entitlement to Colorado River water, not all of which is currently being used. A portion of this entitlement -- said to be approximately 50,000 acre-feet per year -- would be used by the Kaiparowitz project to generate power largely for the benefit of populations in Arizona and California. Both of these states also have entitlements to Colorado River water.

Utah is an arid state where development of any kind tends to be limited by available water. The extraction of mineral resources usually requires only modest amounts of water, but conversion or use of these mineral commodities frequently requires large amounts of water, e.g., the extraction of coal or oil or copper from the earth requires little water, but their conversion to electric power, petrochemicals or other products useful to man usually requires substantial quantities of water. And the most efficient and socially acceptable conversion location is often adjacent to the point of extraction. Thus, in the case of Kaiparowitz, Utah would be producing its coal and allocating some of its limited water supply for the benefit of populations in Arizona and California.

Utah also has wide areas of potential agricultural land that cannot be developed because of limited water. Considering the predicted world food shortage, pressure and opportunity will be upon Utah to develop its agriculture and otherwise attain a maximum balanced use

Mr. Paul L. Howard, State Director
Bureau of Land Management
September 18, 1975
Page 3

17

of its water. Considering the export potential for agricultural products and the national demand for imported petroleum, water can be directly equated with energy itself through the medium of a balance of payments in international trade.

With respect to the Kaiparowitz project and water required to generate power for the benefit of Arizona and California, it would appear prudent for the State of Utah to allocate this water with a reservation. Such reservation could provide that Utah would supply water for Kaiparowitz from its Colorado River entitlement until such time as the water was needed for other uses in the State, including further mineral development. At such time, Arizona and California would be expected to transfer some of their entitlements to Colorado River water to the State of Utah in an amount sufficient to satisfy power generation needs on those increments of power transmitted to them. In such ultimate event, Utah would then provide the coal, but Arizona and California would provide the water needed to generate their own energy requirements.

Of course, the question of water and its allocation is a matter that should remain for the States to work out. It should not be of direct concern to the federal government in considering projects such as Kaiparowitz.

We believe that as a society we have no -- repeat no -- alternative to the development of the mineral resources available to us, if our standard of living and international status in the world community of nations is to be maintained at anything like the levels we have come to accept. And, because minerals are where you find them, we have few alternatives as to where such developments take place. Similarly, we as a people have very limited alternatives as to the timing of development, which will and should be largely governed by demand and the market place. We may, within limits of economic and practical feasibility, have alternatives as to how such developments are undertaken. The minerals industry and its counterparts in manufacturing are committed to courses of action that will minimize adverse impact on the quality of life in operating areas. Here, too, the Kaiparowitz project fits this pattern.

We hope you may find these comments of value.

Cordially,



Paul S. Rattle

cc: UMA Members

IX-161

COVER SHEET TO FEDERAL GRANT APPLICATION/HEARING NOTIFICATION
ARIZONA

1. APPLICATION DATE: 10/1/77

2. FEDERAL EMPLOYER USE ONLY

3. AGENCY: BUREAU OF LAND MANAGEMENT, U.S. DEPT. OF THE INTERIOR, SALT LAKE CITY, UTAH 84111

4. PROJECT TITLE: KAIPAROWITS POWER PROJECT

5. PROJECT LOCATION: 125 S. STATE STREET, SALT LAKE CITY, UTAH 84111

6. PROJECT DESCRIPTION: PROPOSED CONSTRUCTION AND OPERATION OF A 3,000KW GENERATING PLANT, FOUR COAL MINES AND OIL SUPPORT FACILITIES, UNDESIGNED QUARRY, TRANSMISSION SYSTEM, ACCESS ROADS, NEW HIGHWAY AND NEW TOWN.

7. PROJECT FUNDING: FEDERAL GOVERNMENT, STATE OF UTAH, PRIVATE INDUSTRY

8. PROJECT START DATE: 1978

9. PROJECT END DATE: 1982

10. PROJECT STATUS: PROPOSED

11. PROJECT TYPE: POWER

12. PROJECT AREA: 125 S. STATE STREET, SALT LAKE CITY, UTAH 84111

13. PROJECT CONTACT: Mr. John Rammiller, Director, Oil & Gas Conservation Commission, 8685 N. Central, Suite 106, Phoenix, AZ 85020

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18

Environmental Task Force

19

Paul Howard, State Director
Bureau of Land Management
125 South State St.
Salt Lake City, Utah 84111

September 20, 1975

Dear Mr. Howard:

The Environmental Task Force is an organization of one hundred twenty citizens of the Roaring Fork Valley on Colorado's Western Slope, many of whom are frequent visitors to Southeast Utah for scenic and wilderness recreation. Because of the admitted certainty of air pollution, enormous consumption of water, population pressure, proliferation of roads and power lines and many other consequences, all in the absence of a co-ordinated national energy conservation policy, we unequivocally oppose approval of the Kaiparowits power generation project on the grounds that it is both disruptive and unnecessary.

Environmental Task Force also believes that the September 30 deadline for studying the 2,700 page environmental impact study is inadequate, and requests an extension for comment of at least sixty days.

Environmental Task Force would like this statement included in the hearing record.

Sincerely,
Bruce Berger
Bruce Berger, Legislative
Correspondent

This project is referred to you for review and comment. Please evaluate as to:

- the project's effect upon the plans and programs of your agency
- the importance of the consultation to future and/or existing goals and objectives
- in accord with any applicable law, areas or regulations with which you see conflict
- additional considerations

Please return this form to the Commission no later than 15 working days from the date noted above. Please continue the dialogue if you need further information or additional time for review.

- ☐ No comment on this project
☐ Response is requested in writing
☐ Comments are indicated below

Comments (in additional space if necessary)

September 16, 1975

We have been unable to answer your inquiry concerning this agency's review of the environmental impact draft for the Kaiparowits Project. We have now completed this review and find that the proposed program will not affect the plans or projects of this agency. The Commission does support the proposal as presented to us.

Oil & Gas Conservation Commission

John Rammiller

September 16, 1975

371-5161

IX-462

BOX 3682, ASPEN, COLORADO 81611

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

September 17, 1975

ROCKY MOUNTAIN REGION
FAA REG. STATION, P.O. BOX 7213
DENVER, COLORADO 80221

21



Mr. Paul Howard
State Director
Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

We have reviewed your draft environmental impact statement on the proposed Kalparowits Power Project.

The proposed project involves FAA jurisdiction by law or expertise, chiefly from the standpoint of adverse impact on public airports and navigation aids which involve FAA planning, development or maintenance, airspace intrusion, air traffic and electromagnetic interference (direct and passive). To the best of our knowledge, the activities of the proposed project will not significantly interact on these factors.

We wish to compliment the responsible agencies for making provision for an airport in the planning of the new town to be built as part of the proposed project. Our Airports District Office in Salt Lake City (116 N. 24th West Street, 801-524-4260) is available to assist local officials in siting the airport and in exploring possibilities for airport development aid.

We also note that although the FAA has an advisory role to provide airport-related airspace determinations and airspace obstruction clearances on application from both public and private sources, such notifications or requests from private owners might not be transmitted to the FAA in advance of the completion of planning or start of construction. Thus we advise that your future consultation with local planning authorities include the question of whether plans exist for the construction of private airstrips or other projects in the path of the proposed project.

Thank you for the opportunity to comment on the draft environmental impact statement for the proposed Kalparowits project.

Sincerely,

Nicholas J. Xidis

NICHOLAS J. XIDIS
Acting Chief, Planning Staff



IX-463



CITY OF BANNING

161 West Ramsey Street
Banning, California 92220
Telephone (714) 849-4511

22

September 16, 1975

Bureau of Land Management
State Director, Utah State Office
125 South State Street
Salt Lake City, Utah 84111

Re: Kaiparowits Power Project: Environmental Impact Review
Devers - Serrano Segment

Dear Sirs:

The City of Banning, California is located in the San Geronio Pass which is the primary passage between the Los Angeles metropolitan area and the Colorado Desert. While the San Geronio Pass has seen far less environmental destruction than many areas of comparable population in California, the preservation of the environmental quality of the Pass Area is begging for sensitive conservation efforts, particularly in regard to scenic values.

The San Jacinto mountains rise to an elevation of 10,831 feet and make up the southern boundary of the Pass while the San Bernardino mountains constitute the northern boundary of the Pass.

The bordering mountain ranges characterize great natural scenic beauty and must be carefully conserved so that they may be enjoyed by present and future generations.

The proposed transmission system would cross over and be visible from State Highway 243. The State of California has declared Route 243 as a Scenic Highway and specific environmental review indicating total visual impact to this area should be prepared.

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Bureau of Land Management
Page 2
September 16, 1975

The Devers - Serrano segment, as proposed, would be visible from Interstate Highway 10 for an undetermined length. The visual pollution and effect to the thousands of travelers on this Highway annually was not considered.

The Kaiparowits transmission system "if" installed in the corridor at the base of the San Jacinto Mountain will cause irreversible adverse effects to the visual quality of the Pass environment. As the City of Banning already has many utility corridors passing through the community, the cumulative effect of additional transmission lines on our environment must be considered.

As a Master Plans for the location of future transmission lines has not been prepared, the visual pollution of any separate line cannot be totally determined. The scenic values of the Banning area could well be destroyed by indiscriminant piecemeal installation of transmission lines.

Southern California Edison Company is proposing the Devers-Vista No. 1 and No. 2 transmission line in an existing corridor north of Banning which will mean additional visual pollution of the Pass Area.

The draft environmental review cannot be considered as complete or accurate and should not be accepted until a Master Plan for all utility corridors, existing and future, has been prepared and evaluated for possible visual effects to the environment.

In conclusion, the City of Banning requests the Bureau of Land Management to comply with the intent of the National Environmental Policy Act of 1969

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Bureau of Land Management
Page 3
September 16, 1975

and the California Environmental Quality Act of 1970 and cause to have completed additional in depth studies on the possible visual effect to the aesthetic value of the Pass Area.

We further request that additional public hearings be conducted in the State of California, as a project which could have harmful effects to a substantial number of citizens deserves more attention than has been scheduled.

The citizens of Banning demand that their heritage of unobstructed mountain views be protected and preserved for future generations.

Sincerely,


Perry Horton
Chief Building Inspector

PLH:slh

IX-465

September 19, 1975

Paul L. Howard, State Director
U. S. Dept. of the Interior
Bureau of Land Management
Federal Bldg.
P.O. Box 11505
Salt Lake City, Utah 84111

Dear Mr. Howard:

The following comments are in behalf of the members of the Rocky Mountain Federation of Mineralogical Societies by Elsie S. Matthews, Chairman of Conservation of Recreational Lands.

First I would like to state that Conservation of Recreational Lands entails favoring multiple use of public lands with special emphasis on recreation, which includes looking for and collecting rock, mineral and gem specimens and driving through, and sometimes camping on national as well as private land. As well behaved citizens and ardent supporters of the Johnny Horizon and Woody Owl programs, we do not litter but on the other hand are gathers-up of other persons' litter. We are enclosing a copy of our Code of Ethics.

Second, the following are comments on the Kaiparowits project:

Vol. I -

Summary: Point 3; 8th line in 3rd paragraph. "The indirect effect impact of increased population would cause environmental effect on other resource values e.g. increased recreational use, which would cause soil erosion, destroy vegetation, disturb wild life, etc." We would prefer that the following words be added to that sentence or substituted for the present words - see underlines - change "would" to "might" add at end of sentence, "unless a set of regulations governing such use is drawn up and implemented"

Vide: California Desert Plan of the BLM.

4th paragraph - We feel that the saving of 80,000 barrels of oil daily would be a significant contribution to our energy needs. We need gasoline, motor oil and for self contained vehicles propane gas for our activities such as rock hunting and litter clean-ups. Point 4 - "Alternatives" as far as we can tell (and many of us are engineers or have studied in engineering and energy fields) the present plan seems to be a good one with enough alternatives suggested and we feel that the money that would be needed to work out alternative plans could be put to better use.

We feel that delay or denial would be a big mistake. Though it all boils down to the question of whether we are to preserve human or wildlife. We prefer preserving "homo sapiens" instead of "fossil natural" but we also feel that in the vast areas surrounding the project there is room for all including flora as well as fauna. We have traveled through and stopped at most of the areas surrounding the project during the past 25 years and have found no areas that have been appreciably damaged by tourists.

Chapter II - Ecological Interrelationships. On page II-238 3rd paragraph "disturbing desert scrub vegetation." Comment: But there is so much desert and so little - comparatively - energy resources. We have seen the desert areas after a heavy rainfall when the whole terrain has been changed more thoroughly than could ever be done by man.

Page II-241 ff. Paleontological, archeological, and historical. In order to preserve, classify and when necessary protect such areas - all would suggest getting help from organizations such as Universities and governmental institutions to study and classify such areas and to give suggestions as to their preservation - specimens of paleontological and archeological materials and artifacts could be then given to museums where they would be preserved. One of the counties that might be interested is San Bernardino County, California. We would suggest that arrangements be made with interested universities which might give scholastic credits to students and instructors doing actual work in the field. The data you have set forth in this section would be a big help for such persons. Incidentally many of the areas involved above have been discovered by rock and mineral club members.

Recreational Resources - pages II-286 ff on page II-293 - 2nd paragraph. "Hunting for fossils" "petrified wood" etc.

Comment - I believe that limitations on amounts collected by individuals instead of prohibition of collecting would go far to solve the problem of "saving the resource for enjoyment of future generations". The next generations "grandparents, parents and children should be given consideration instead of saving everything for future generations who may not be interested or have any way or means to get to such areas. A strict prohibition against commercial collecting should be implemented and enforced

Chapter III - page III-4 Topography and Geology - to counteract bad effects see bibliography #795 - "Planning the Reclamation of Mined Lands.

Page III-9 - Impacts on Paleontological, archaeological and historic. Perhaps you should call in the U. S. Army Corps of Engineers to help. They have successfully caused the inundation of many similar areas for damming rivers etc. for power or for creating lakes for recreational areas or for water purification. I would like to recall to you the question asked by the late, great Sir Winston Churchill, who told critics of Aswan dam in Egypt - "Is it better to have some artifacts which are no practical use, than to provide water so badly needed by the present day population?"

3rd line of above paragraph - "disturbance or destruction by unauthorized collectors, and recreational users, and point 3 under Recreational Resources - I do not believe that rock collecting would have an adverse effect on such areas and I would like to state here that back packing and ORV use are not the modes of locomotion used by most rock collectors many of who are senior citizens and have self-contained vehicles - permitting use of established roads by such persons would mitigate any adverse effects. Rock hounds could do a lot by helping to identify the various types of fossils, rocks and artifacts. As for vandals they are in a separate category and should not be lumped in with law abiding persons.

Chapter V - Adverse effects Recreational Resources. Page V-7 - 2nd paragraph. Many tourists would enjoy seeing the facilities and would feel that something was being done for people. 3rd paragraph. My studies have shown that we have a quite sufficient amount of "back-country" already set aside so what is lost here would hardly be missed.

4th paragraph. Perhaps use of ORV's should be regulated and defined. I note you have a definition for ORV's in "Reference materials" page A-11 - a distinction should be made between ORV's and campers and self-contained vehicles which cannot be driven off roads. Ordinary vehicles and ORV's do not do such damage. (1) Vandalism of archeological sites. This could be controlled by vigorous patrolling at first and by requiring permits which would have to be surrendered at a control point when persons and vehicles could be inspected. (3) Increase of litter and man-made fires - Again persons with self-contained vehicles have a place for their litter and do not make outside fires - We have found that on a collecting trip there are always one or more self-contained vehicles in the group. V-49 - Paleontological, archeological and historical destruction or disturbance - See comment re. Corps of Engineers ante. V-52 - 3rd Paragraph - Perhaps the new town could be planned and laid out so as to preserve such scenic sites or a view point established. V-55 - We object to the statements set forth in (1) thru (7) - We do not commit any of the offenses mentioned and are well-aware of the Antiquities Act (6) Perhaps this refers to residents of the new town - if so I believe close attention should be given to the types of persons employed. We noted that in the Rainbow Basin near Berstow, California, no guards are present yet the persons touring that basin comply with the regulations. The same is true of the Mesa Verde etc. historical sites and in Platt National Park in Oklahoma.

Chapter VI-16 - Opening up access roads to the public should be a plus factor since more residents and tourists would use the roads instead of traveling all over the primitive areas. I would like to compliment the compilers of this work for their thorough coverage with adequate graphs, figures and photographs to illustrate their objectives and their explanations of project and alternatives. The volumes contain much useful knowledge and I shall enjoy perusing them more fully later. The bibliography is quite extensive and I recognize many old friends among the books etc. listed.

I am enclosing a copy of a bibliography on planning the Reclamation of Mined Land.

In regard to the statements in the 2nd and 3rd paragraphs of the errata sheet for Chapter I, that the proposed site is in a Class II air quality division and that if the surrounding areas of the proposed site be classified as Class I because of the proximity of to national forests, parks and recreation lands.

I hope that the Congress will not be pressured into declaring or classifying the surrounding areas as wilderness areas even though they are classified as national forests etc. I feel that such a project as the proposed Kaiparowits would not cause much harm to such areas, not nearly as much as one careless back packer can cause by leaving a still burning camp-fire. Wild recent forest fires in California. Also if too many restrictions are placed on

this and other energy engendering projects causing such operations to be unfeasible, then our fossil fuels will have to be used and what use will all the wilderness areas, National Parks etc be if no one has the means to get there. Its a long hike from New York to California or from most places in this country to the National Parks and also if might be the case - no food or water could be found in any of the towns or cities along the way.

The above are general comments of a concerned citizen who would not like to go back to the earlier years of the 20th century.

Elsie S. Matthews "act" 74
Mrs. Thomas A. Matthews
926 Sandstone
Bartlesville, Okla. 74003

129-X-7



Rocky Mountain Federation
of
Mineralogical Societies, Inc.

September 26, 1975

23



OFFICERS 1974-1975

MRS. LOUISE L. H. MONTGOMERY, President
1104 Colfax,
Tampa, Kansas 66066
Phone (913) 864-1290

JAMES C. LANE, Editor, Vista Proceedings
3128 Peach Blossom Drive,
Phoenix, Arizona 85029
Phone (602) 241-1234

MRS. RANNEY ROTH, Secretary
Box 112
Green, Kansas 66457
Phone (913) 864-2138

DR. ARTHUR SCHONDERMARK, Treasurer
805 Shaw Avenue
Fort Collins, Colorado 80521
Phone (303) 485-6220

MRS. ALBERT FRIEDL, Historian
2817 Magnolia Avenue
El Paso, Texas 79930

PAST PRESIDENTS

WILSON A. DEBAND
P.O. Box 969
Anthony, New Mexico 88001

CLARENCE WOLF
6760 East River
Colorado Springs, Colorado 80915

STATE DIRECTORS

ARIZONA
MARIONA HILLS
P.O. Box 814
Chinoval, Arizona 86021

COLORADO
STREETLY, PARSHALL
2620 South Point
Denver, Colorado 80210

KANSAS
CLARENCE KIRLIN
2024 South Edwards
Topeka, Kansas 66617

NEBRASKA
CHARLES GUNOREAULT
1711 Avenue J
Lincoln, Nebraska 68510

NEW MEXICO
JOHN F. HAYES
7602 Jay Place N.E.
Albuquerque, New Mexico 87109

NORTH & SOUTH DAKOTA
W. L. ROBERTS
622 Maple
Herald City, South Dakota 57701

OKLAHOMA
JIM HICKEL
1200 North Canyon
Owasso, Oklahoma 73062

UTAH
EDGAR S. JARHEAD
202 South Main
Nabes, Utah 84007

WYOMING
WILLIAM H. GUTHRIE
215 South Fremont
Casper, Wyoming 82401

Paul L. Howard, State Director
U.S. Department of the Interior
Bureau of Land Management
Federal Building
P.O. Box 11505
Salt City, Utah, 84111

Dear Sir:

In regard to the "comments" on the
Kaibarowits project which I sent to you, Sept.
19, 1975, there are a few typographical errors.

Sic: 1st page-5 lines from bottom of page "feral"
should read ferse "

Page 2 Second par. 3rd line "all" should read "I"

Page 3-2nd par-5th line "ORV" should read "RV"
" 86th line from bottom of page
strike word "of" before "to"/
Page 3 Par starting with "Chanter VI-16, 7th line
last word should read instead of "persuine"; "persuine".

Page 4 6th line change "if" to "as".

Signature change "act" to "AET" (Latin abbreviation
for age).

The above unfortunately occurred because
I had written 8 pages of legal size yellow mad
manuscript, and my typist was not familiar with
all of the words used and missed some of the other
words. Since time was of the essence she did not
wait for me to rrrrr read it.

Cordially yours,

Mrs. Elsie S. Matthews

C.C. to Curt Berkland
Dept of Interior
BLM
Rm 5625, Interior Bldg.
Washington, D.C.

20240

CHAIRMAN
CONVENTION OF ROCKY MOUNTAIN
LANDS
Rocky Mt. Fed. Min. Soc. Inc.

Mrs. Elsie S. Matthews
736 Sandstone
Bartlesville, OK 74603

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STATE OF UTAH
Calvin L. Rampton, Governor
DEPARTMENT OF
DEVELOPMENT SERVICES
Division of State History
Melvin T. Smith, Director
603 East South Temple
Salt Lake City, Utah 84111
Telephone: (801) 328-5755

September 19, 1975

Mr. Paul Howard
State Director
Bureau of Land Management
Federal Building
Salt Lake City, Utah 84111

Dear Mr. Howard:

The Historic Preservation Office of the Division of State History has completed its review of the draft environmental statement on the Kaiparowits project and has the following comments:

- a. On the whole the treatment of historical and archeological resources lacks thoroughness, which would appear to be the result of limited survey work and the absence of high-level professional guidance.
- b. In the absence of survey and research work on the portions of federal land to be turned over to private interests, it is possible that this transfer of property would not satisfy the requirements of Section 106 of the National Historic Preservation Act of 1966, and, further, that under sections 1153 and 21(b) of Executive Order 11593 and the "Procedures for the Protection of Historic and Cultural Property (36 CFR Part 800)" would be unlikely to pass review by the President's Advisory Council on Historic Preservation.
- c. We draw your attention to similar comments by the State Archaeologist in his letter of August 4, 1975.

Our purpose in indicating these deficiencies in the draft environmental statement is to avoid the inevitable delays that would be caused by failure to adhere to all the national legislation affecting historic and archeological resources.

Sincerely,

Melvin T. Smith
John S. J. Smith
Preservation Planning Specialist

JSJS:clw



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DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
REGIONAL OFFICE
FEDERAL BUILDING, 1761 STOUT STREET
DENVER, COLORADO 80202

September 22, 1975

IN REPLY REFER TO:
808

REGION VIII

Mr. Paul L. Howard
State Director
Bureau of Land Management
Department of the Interior
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

On August 8, 1975, Richard Brown wrote to you and indicated that he was forwarding the Draft Environmental Impact Statement for the Kaiparowits Power Project to this office for appropriate comments. We note that the emplacement of this project will take place in a primarily rural area, but will have a high impact as a result of transmitting power to highly urbanized areas. Discussion of the impacts on the urban areas is adequately covered.

Since HUD's areas of jurisdiction for comment as established by the Council of Environmental Quality all apply to urban areas, the balance of our review was limited. We offer, however, that when planning new roads and railroad trackage, that they be far enough from areas set aside for residential use so as to avoid noise problems. HUD has definitive guidelines on noise levels and if we can assist you later with this concern, please feel free to contact us.

Our only remaining comment is that we would encourage Governor Rampton's Kaiparowits Planning and Development Advisory Council to expand its activities into helping plan for the new town to assure safe and sanitary housing.

Sincerely,

David L. Witt
David L. Witt
Director Environmental Quality Division
Community Planning and Development

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STATE HISTORY BOARD: Dr. Milton C. Abrams, Chairman Theron B. Lake Jacinta Brooks Elizabeth Montague - Howard C. Price, Jr.
Dr. Delia G. Dayton Dr. Richard O. Ulmer Helen Z. Papachouas Clyde L. Miller Elizabeth Skeneby Naomi Woolley

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LAKE POWELL
RESEARCH PROJECT

An interdisciplinary study of a new lake in an arid land

DR. GORDON C. JACOBY, JR.
HYDROLOGIST
(602) 774-8921

LAKE POWELL RESEARCH PROJECT
BOX 1309
FLAGSTAFF, ARIZONA 86001

15 September 1975

Mr. Paul Howard
State Director
Bureau of Land Management
P.O. Box 11505
Salt Lake City, UT 84111

Dear Mr. Howard:

The following comments are in regard to the Environmental Impact Statement for the Kaiparowits Project. I realize that to cover all aspects of the impact is a formidable task and your staff has made a real effort, but there are some points where correction and improvement should be made.

In Chapter III, page 5, under the heading, "Water Resources," the statement is made in the second sentence that withdrawal of the 50,000 acre feet for Kaiparowits "would reduce Utah's remaining allocation of Colorado River by about 3.8%." This statement can only be termed extremely misleading. The earlier portions of the report state that the figures are based on the Department of Interior estimate of 5.8 million acre-feet being available for Upper Basin consumptive use. After one deducts the 50,000 acre-feet for Arizona, and allots 23% of the remainder to Utah, this gives the figure of 1,322,000 acre-feet remaining for the State of Utah. This is the figure used in the EIS. The 1974 figure for consumptive use in the state of Utah is 825,000 acre-feet per year. Simple subtraction gives the state of Utah a remaining amount of 497,000 acre-feet per year of consumptive use to allocate for new users. These figures are reviewed in Chapter I, page 354. If 50,000 acre-feet per year are used for the Kaiparowits plant, this would amount to 10% of Utah's remaining allocation of Colorado River water. If the Kaiparowits Plant uses the full 102,000 acre-feet that they have contracted for, then this facility would be using over 20% of Utah's remaining allocation of Colorado River water. The 50,000 acre-feet per year figure is actually 3.8% of the entire amount of Colorado River water available for use in the State of Utah. The 102,000 acre-feet contracted for, amounts to approximately 7.7% of the entire amount of surface water available from the Colorado River system for the State of Utah. These points should be made clear. There should be no possibility for misunderstanding the size of the percentage of Utah's share of the Colorado River water that will be, and could be, used by the Kaiparowits Power Plant.

Again, in Chapter III, page 120, it is restated that, "withdrawal and depletion of 50,000 acre-feet per year for the proposed project would decrease Utah's remaining share of Colorado River water (1,322,000 acre-feet per year) by about 3.8%." This statement also must be corrected to state that it is 3.8% of the entire allotment for the State of Utah and that it is over 10% of the remaining share of Colorado River water for the State of Utah.

In Chapter I, on page 358, there is a statement indicating 1,368,500 acre-feet of water has been filed for in the State of Utah in relation to possible energy developments. The EIS should differentiate between how much of this water is surface water and how much of it is groundwater. It is unclear whether this is all in the Colorado River Basin or not. This should be clarified. The point should be made in the EIS that as a result of these filings, there is probably not enough water for all energy uses, let alone all other uses. Some applications cannot be approved because physically there is not enough water for all. It is stated that the state engineer has not moved on some applications for several years. This perhaps is one reason for the caution in approving new applications because it is realized that there will have to be denials, and the need for careful analysis of each application is in order.

A graphic example of the situation is revealed by Figure 23, page 376, Chapter VIII. Applications for water rights have been made for 235,000 acre-feet per year for energy-related projects using the Escalante River as the designated source. An analysis of the U.S. Geological Survey records for this river indicate an average annual flow of about 80,000 acre-feet per year. In my opinion, the final EIS should emphasize the realization of the demands being placed on the water supplies of Utah by Kaiparowits and other energy-related projects.

Another topic that should be cause for considerable concern is the description of the ultimate fate of the evaporating ponds and the sludge material from the power plant. It seems to be more or less stated that after the lifetime of the plant the containment of the remaining salts in the evaporation pans and the sludge, with its toxic trace elements, will most likely wind up in Lake Powell, as the dams and barriers are no longer maintained, eroded away, and the material washed down into the lake. It would be hoped that there is some alternative rather than just stating that this is an inevitable consequence. The entrance of these materials, some of them toxic, into Lake Powell after the 35 year life-time of the plant, would have a serious negative effect on the water quality of the reservoir.

It is interesting to note in Chapter VIII, page 378, that if the nine million tons of coal that would be consumed by the Kaiparowits Power Plant were utilized in a coal gasification plant, this

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system, according to the estimates, would consume only 7,550 acre-feet per year of water, as opposed to the estimated 50,000 acre-feet per year that will be consumed by the Kaiparowits Power Plant.

As a minor editorial comment, in Chapter II, on pages 290-291, the captions for the illustrations are reversed. The Cockscomb is shown on page 290 and the sandstone formations in the Escalante area are shown on page 291, the opposite of what the two captions state.

I hope these comments are of use in preparing the final statement.

Sincerely,

Gordon C. Jacoby, Jr.

Gordon C. Jacoby, Jr.
Hydrologist

GJJ/srb

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LAKE POWELL RESEARCH PROJECT

An interdisciplinary study of a new lake in an arid land

Coordinators: ORSON L. ANDERSON
JERROLD E. LEVY

Executive Secretary: Tricelle C. Perkins
INSTITUTE OF GEOPHYSICS
UNIVERSITY OF CALIFORNIA, LOS ANGELES
LOS ANGELES, CALIFORNIA 90024
Telephone: 213-825-2660

August 15, 1975

Mr. Paul Howard
State Director
Bureau of Land Management
P.O. Box 11505
Salt Lake City, Utah 84111

Dear Mr. Howard,

Within the past week the Lake Powell Research Project (LPRP) Coordinator's office received two copies of the EIS of the Kaiparowits Project, and Gary Weatherford of the LPRP received a copy in San Diego, but there was no covering letter accompanying them and the copies were not dated. Although we do not know the time constraints on replies to the EIS, we are submitting immediately this letter with our official comments on the Draft EIS. We hope that these comments will become part of the official record, and we hope that additional comments can be entered in the near future by our Project sociologist, Professor Ronald L. Little, our Project hydrologist, Dr. Gordon C. Jacoby, Jr., and by our Project atmospheric physicists, Drs. Eric G. Walther and Michael D. Williams.

We are happy to report that we find the EIS satisfactory in its general aspects, with one important exception. We also wish to make a number of specific comments on details.

A tremendous amount of data has been accumulated, and we are impressed with the diligence and skill with which your staff assembled this statement. Its quality is definitely superior to recent EIS we have read.

Our conclusion on the debit side is that the EIS fails to indicate the potential cumulative impacts for other proposed projects in the region in addition to the Kaiparowits Project. We would like to see an EIS for the Kaiparowits region, not just the Kaiparowits Project, which is only the first of several proposed coal developments in the region. Most of the comments which follow can be grouped under this general criticism.

PARTICIPATING INSTITUTIONS: ~~UNIVERSITY OF CALIFORNIA, LOS ANGELES~~ • UNIVERSITY OF ARIZONA
UNIVERSITY OF CALIFORNIA, LOS ANGELES • UNIVERSITY OF CALIFORNIA, SANTA BARBARA
DARTMOUTH COLLEGE • JOHN MUIR INSTITUTE • MUSEUM OF NORTHERN ARIZONA
UNIVERSITY OF NEW MEXICO • UNIVERSITY OF ROCHESTER
UTAH STATE UNIVERSITY

Mr. Paul Howard
August 15, 1975

2

Orson L. Anderson
Re: Kaiparowits EIS

Comment #1

On page II-79 of the EIS it is stated that "During the mid-1960s the U.S. Geological Survey (USGS) estimated Kaiparowits Plateau coal resources at 40 billion short tons (2,000 lbs), including major deposits in the Straight Cliffs Formation as well as those of less importance in the Dakota and Tropic Shale Formations."

This statement is not referenced to a particular source in the literature of the USGS, and we feel it should be in view of the magnitude of this large resource,* and the fact that it is one order-of-magnitude larger than the official estimate given by the U.S. Bureau of Mines (1974, Bureau of Mines Circular 8647, Fuel and Energy Data 1972, by Crump and Reading, page 58. On this page, 4.025 Billion tons of coal are reported for Utah).

The LPRP has compiled the earlier estimates of Kaiparowits coal resources which have appeared in the literature. According to our findings, the official estimate of the USGS in the mid-1960s for coal in the Kaiparowits Plateau was 7.3 billion tons. We believe that it was not until 1974 that the USGS estimate was raised to 40 billion tons. The actual references to various previous estimates are given in Table 1. We believe that the significant feature of these estimates is their rapid increase with time. There is reason to believe that the estimates will INCREASE as further geological exploration is funded and completed. The coal reserves of the Kaiparowits are vast, and the estimate of their magnitude has been rapidly increasing with time. See Table 1 on the following pages.

* One billion tons of coal will produce an amount of electricity approximately equivalent to all the energy used in the United States during a period of 3 months. See page 5, Edward Teller, Energy: A Plan for Action, Commission on Critical Choices for Americans, 1975, 80 pages.

Table 1 is excerpted from the LPRP Interim Report entitled "Kaiparowits Handbook of Coal Resources," by Carey et al.

Table 1. Estimates of Quantity of Coal in the Kaiparowits Plateau

Year	Source	Amount
1961	<u>U. S. Geological Survey^a</u> Initial gross estimate of reserves in beds over 14 inches thick and under less than 3000 feet of overburden. Based on a few measurements of coal thicknesses made by Gregory and Moore (1931) and on general considerations of the thickness and nature of the coal-bearing rocks.	3 billion tons
1969	<u>U. S. Geological Survey^b</u> Resources determined from mapping and exploration for coal with up to 3000 feet of overburden. Estimate by F. C. Peterson based on detailed mapping then in progress, with estimate that potential total would be much larger.	7.3 billion tons
1972	<u>Utah Geological and Mineralogical Survey^c</u> Coal reserves based upon geologic and geographic position and coal outcrop and drill-hole information where available. Includes coal in beds more than 4 feet thick and under less than 3000 feet of overburden.	15.2 billion tons
1974	<u>U. S. Geological Survey^d</u> Unpublished information based on mapping and coal drill-hole information. This is a gross estimate of total resources made for in-house use and includes coal in seams as thin as 14 inches and coal under as much as 6000 feet of overburden. This figure is being revised upward as of November 1974.	40 billion tons

^aAveritt, Paul, 1961, Coal Reserves of the United States, A Progress Report, January 1, 1960, U. S. Geological Survey Bulletin 1136, U. S. Government Printing Office, pp. 79-80.

^bAveritt, Paul, 1969, Coal Resources of the United States, January 1, 1967, U. S. Geological Survey Bulletin 1275, U.S. Government Printing Office, p. 42.

Table 1. footnotes continued

^cDoelling, H. H. and R. L. Graham, 1972, "Kaiparowits Plateau Coal Field," in H.H. Doelling and R. L. Graham, Southwestern Utah Coal Fields: Alton, Kaiparowits Plateau and Kolob-Harmony, Utah Geological and Mineralogical Survey Monograph Series No. 1, pp. 102-103.

^dHoward D. Zeller, personal communication, 1974.

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Mr. Paul Howard
August 15, 1975

4

Orson L. Anderson
Re: Kaiparowits EIS

Comment #2

The vastness of the coal reserves in the Kaiparowits Plateau and the present leasing of this immense resource indicate that more coal-fired powerplants on the Kaiparowits Plateau will be proposed in the near future. (Some indication of additional developments is given by Figure 70, I-346, which shows the location of the proposed Garfield Plant.) We believe that beyond indicating the total coal resources of Kaiparowits, it is equally important to show the leasehold and ownership status of all the Kaiparowits coal in order that judgments about potential future development and cumulative impacts can be made.

On page A-157 of the EIS is printed a map of leases in the area of the proposed development (which may be regarded as the first on the Plateau). Because of the extensive coal resources of the Kaiparowits area, there is actually a much larger contiguous area of leases than this map suggests. In the draft coal chapter of the Kaiparowits Data Book, first distributed in November 1974, a lease map is presented covering a much larger area. We feel that unless the public is given a chance to view the true extent of leasing in the Kaiparowits, it will be difficult to understand the possible cumulative effects of the construction of several mine and powerplant projects on the Plateau. For comparison we enclose here a copy of Figure 16, the lease map from the coal chapter, and the explanatory tables accompanying it. The area reported in the EIS is in heavy outline. It is important in the case of the Kaiparowits EIS to give the public some impression of the future of the whole area, which may include several stages of development because of the extensive coal leases. We feel our more comprehensive map and tables convey a sense of the possible cumulative impact. We feel that the brief statement (page I-116) that the Kaiparowits Project holdings "equal 21 percent of the total" does not adequately present the picture of a large contiguous area of very numerous leases, nor a sense of the impending impact from additional projects.

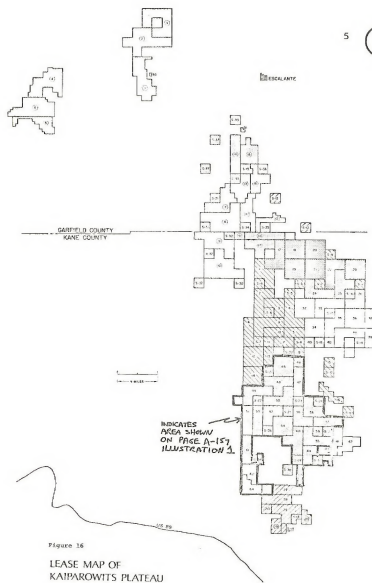


Table 2: Federal Coal Leases in the Kaiparowits Region, Utah

Map Number	Lessee	Lease Number	Date	Terms of Lease ^a	Acreage
1	El Paso Natural Gas	U-0130985	11-1-68	SPR	2560.00
2	El Paso Natural Gas	U-0130986	10-1-67	SPR	2561.52
3	El Paso Natural Gas	U-0148535	10-1-67	SPR	1920.00
4	El Paso Natural Gas	U-0115791	7-1-67	SPR	2560.00
5	El Paso Natural Gas	U-0115793	7-1-67	SPR	1280.00
6	El Paso Natural Gas	U-0130988	7-1-67	SPR	1907.24
7 ^b	El Paso Natural Gas	U-24427	3-1-67	SPR	1280.00
8 ^b	El Paso Natural Gas	U-27835	11-1-65	SPR	640.00
9	El Paso Natural Gas	U-0130989	10-1-67	SPR	2560.00
10	El Paso Natural Gas	U-0115792	10-1-67	SPR	1280.00
11	El Paso Natural Gas	U-0115833	10-1-67	SPR	640.00
12	El Paso Natural Gas	U-0140837	10-1-67	SPR	2553.40
13	El Paso Natural Gas	U-0136512	10-1-67	SPR	1279.28
14	El Paso Natural Gas	U-0140826	10-1-67	SPR	2557.28
15	El Paso Natural Gas	U-083005	12-1-64	CBC ^c	640.00
16	El Paso Natural Gas	U-083000	12-1-64	CB ^d	1440.00
17	Consolidation	U-0105418	9-1-67	SPR	2560.00
18	Consolidation	U-0149373	11-1-69	SPR	2560.00
19	Consolidation	U-0103107	9-1-67	SPR	2560.00
20	Consolidation	U-098783	5-1-67	SPR	2540.64
21	Consolidation	U-098785	5-1-67	SPR	2542.84
22	Consolidation	U-098787	5-1-67	SPR	2560.00
23	Consolidation	U-0103129	9-1-67	SPR	2560.00
24	Consolidation	U-098784	5-1-67	SPR	2537.69
25	Consolidation	U-0103109	9-1-67	SPR	2557.36
26	Consolidation	U-0103130	9-1-67	SPR	2554.88

Table 2 (continued)

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Map Num- ber	Lessee	Lease Number	Date	Terms of Lease ^a	Acreage
27	Hiko Bell	U-0118366	11-1-65	SPR	1920.00
28	Hiko Bell	U-0120794	3-1-66	SPR	1920.00
29	Hiko Bell	U-0146654	12-1-65	SPR	2560.00
30	G.H. Frandson	SL-050638	5-10-41	MP ^e	40.00
31	G.H. Frandson	SL-048223	4-5-30	MP ^e	120.00
32	Peabody	U-098786	3-1-67	SPR	2549.60
33	Peabody	U-0103108	3-1-67	SPR	2560.00
34	Peabody	U-096476	3-1-67	SPR	2551.52
35	Peabody	U-0115657	11-1-67	SPR	2560.00
36	Peabody	U-0103131	4-1-67	SPR	2560.00
37	Peabody	U-0103132	4-1-67	SPR	2171.68
38	Peabody	U-0103133	4-1-67	SPR	1273.16
39	Peabody	U-0115656	11-1-67	SPR	2560.00
40	Peabody	U-096477	3-1-67	SPR	1276.68
41	Peabody	U-0101140	4-1-67	SPR	1600.00
42	Peabody	U-0101141	4-1-67	SPR	1760.00
43	Peabody	U-0113254	8-1-67	SPR	160.00
44	Resources ^g	U-0101142	4-1-67	SPR	1562.08
45	Resources	U-096496	11-1-65	SPR	2560.00
46	Resources	U-087836	11-1-65	SPR	1279.92
47	Resources	U-087835	11-1-65	SPR	639.92
48	Resources	U-096497	11-1-65	SPR	2560.00
49	Resources	U-096495	11-1-65	SPR	2559.84
50	Resources	U-096494	11-1-65	SPR	2560.00

^g"Resources" refers to leases of Resources Company, Mono Power Company, and New Albion Resources Company

Table 2 (continued)

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Map Num- ber	Lessee	Lease Number	Date	Terms of Lease ^a	Acreage
51	Resources	U-092139	11-1-65	SPR	1934.73
52	Resources	U-092140	11-1-65	SPR	2022.48
53	Resources	U-092141	11-1-65	SPR	1972.16
54	Resources	U-087834	11-1-65	SPR	2560.00
55	Resources	U-087806	11-1-65	SPR	1945.32
56	Resources	U-087805	11-1-65	SPR	2064.44
57	Resources	U-087807	11-1-65	SPR	1920.00
58	Resources	U-096486	11-1-65	SPR	640.00
59	Resources	U-087833	11-1-65	SPR	2517.68
60	Resources	U-087828	11-1-65	SPR	2560.00
61	Resources	U-092138	11-1-65	SPR	1891.44
62	Resources	U-096509	11-1-65	SPR	1478.70
63	Resources	U-096508	4-1-66	SPR	658.28
64	Resources	U-092142	11-1-65	SPR	1750.20
65	A. Shakespear	SL-071561	3-1-51	MP ^f	80.00

^aSPR = Standard preference right. Standard lease terms are 15¢/ton for underground coal and 17.5¢/ton for strip mined coal for the first 10 years, increasing to 17.5¢/ton underground and 20¢/ton strip mined coal thereafter. The required rental to be paid in advance if no coal is being produced is \$1 per acre per year.

^bEffective November 1974.

^cCompetitive Bid bonus \$8.75/acre.

^dCompetitive Bid bonus \$9.25/acre.

^e15¢/ton maximum production 275 tons.

^f15¢/ton maximum production 550 tons.

Table 3: Federal Coal Permits in the Kaiparowits Region, Utah
(Circled Numbers on Lease Map, Figure 16)

Map Num- ber	Permittee	Permit Number	Date	Rental	Acreage
1	Woods Petroleum	U-6652	10-1-69	25¢/acre	4203.05
2	Woods Petroleum	U-6653	10-1-69	25¢/acre	4926.00
3	Woods Petroleum	U-6654	10-1-69	25¢/acre	4480.00
4	Jesse Knight	U-0149368	5-1-67	25¢/acre	4453.35
5	Jesse Knight	U-0149348	5-1-67	25¢/acre	2304.00
6	Jesse Knight	U-149349	5-1-67	25¢/acre	4726.84
7	Sun Oil	U-5666	7-1-69	25¢/acre	3680.00
8	Sun Oil	U-5667	7-1-69	25¢/acre	5120.00
9	Sun Oil	U-5668	7-1-69	25¢/acre	4454.00
10	Sun Oil	U-5669	7-1-69	25¢/acre	5120.00
11	(Delcoal) ^a	U-5233	10-1-68	25¢/acre	2500.32
12	(Delcoal) ^a	U-5234	10-1-68	25¢/acre	1440.00
13	(Delcoal) ^a	U-5235	10-1-68	25¢/acre	2560.00
14	(Delcoal) ^a	U-5236	10-1-68	25¢/acre	2560.00
15	(Delcoal) ^a	U-5237	10-1-68	25¢/acre	2522.68
16	(Delcoal) ^a	U-1375	10-1-68	25¢/acre	2306.45
17	(Rasmussen) ^a	U-1362	2-1-69	25¢/acre	2552.76
18	(Rasmussen) ^a	U-1363	2-1-69	25¢/acre	1882.87
19	Hiko Bell	U-9901	7-1-70	25¢/acre	968.72
20	Hiko Bell	U-11898	7-1-70	25¢/acre	776.95
21	Hiko Bell	U-0145657	10-1-65	25¢/acre	640.00

^aMap numbers 11 through 18: Utah Power and Light bought option in 1971, was assigned right in 1973 with amendment in 1974. No effective federal right until after moratorium.

Table 4: State Coal Leases in the Kaiparowits Region, Utah

Map Num- ber	Lessee	Lease Number	Date	Acreage ^a
S-1	El Paso Natural Gas	20545	1-1-64	640.00
S-2	El Paso Natural Gas	19785	1-1-63	640.00
S-3	El Paso Natural Gas	19916	1-1-64	640.00
S-4	El Paso Natural Gas	24154	3-27-67	640.00
S-5	El Paso Natural Gas	21357	1-1-65	640.16
S-6	El Paso Natural Gas	21356	1-1-65	640.00
S-7	El Paso Natural Gas	21355	1-1-65	640.00
S-8	El Paso Natural Gas	19661	1-1-63	640.00
S-9	El Paso Natural Gas	19784	1-1-63	640.00
S-10	El Paso Natural Gas	19357	5-11-62	640.00
S-11	El Paso Natural Gas	20440	1-1-64	725.84
S-12	Hiko-Bell	26719	12-15-69	1280.00
S-13	Hiko-Bell	26600	10-10-69	480.00
S-14	Hiko-Bell	26601	10-10-69	323.95
S-15	Peabody	23904	11-18-66	640.00
S-16	Peabody	19914	1-1-64	638.48
S-17	Peabody	20556	1-1-64	640.00
S-18	Peabody	19660	1-1-63	640.00
S-19	Peabody	20547	1-1-64	640.00
S-20	Resources	19652	1-1-63	640.00
S-21	Resources	19651	1-1-63	640.00
S-22	Resources	19650	1-1-63	640.00
S-23	Resources	19432	6-11-62	640.00
S-24	Resources	19427	6-11-62	640.00
S-25	Resources	19653	1-1-63	690.44
S-26	Resources	19654	1-1-63	640.00

Table 4 (continued)

Map Number	Lessee	Lease Number	Date	Acreage ^a
S-27	Resources	19656	1-1-63	640.00
S-28	Resources	19655	1-1-63	400.00
S-29	Resources	19678	1-1-63	640.00
S-30	Resources	19786	1-1-63	640.00
S-31	Sun Oil	25367	5-6-68	1280.00
S-32	Utah Power & Light	25368	5-6-68	2391.60
S-33	Utah Power & Light	25189	3-7-68	639.96
S-34	Utah Power & Light	25188	3-7-68	640.00
S-35	Utah Power & Light	23906	11-18-66	640.00
S-36	Utah Power & Light	23905	11-18-66	640.00
S-37	Utah Power & Light	25105	2-13-68	1280.00
S-38	Rasmussen	19359	5-11-62	640.00
S-39	Fallick	26842	3-2-70	640.00

^aFor lands under state lease, rental is 50¢/acre/year for the first two years, and at least \$1/acre/year for nonproducing land thereafter, while royalty on producing land is paid at a rate of 4% of the gross coal produced from underground mines and 6% from strip mines, or at the rate prevailing at the time of payment for Federal leases on land of similar character under coal lease, whichever is greater.

Mr. Paul Howard

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Orson L. Anderson
Re: Kaiparowits EISComment #3 -- Impact of Kaiparowits Development on Grosvenor Arch

On page II-295, illustration 43, a map is presented showing the location of Grosvenor Arch, and on pages A-314 through A-317 of the Reference Volume are shown the proposed roads servicing the coal mine and powerplant area. The impact of the road on the Arch was not discussed beyond the assessment that there would be a view of the road from the Arch, and that the Arch is a high visual vulnerability area (II-303, illustration 48). The Arch and the road are not shown on the same maps, making it difficult to see their proximity; maps in two different volumes of the EIS must be viewed simultaneously and compared. We recommend that a map showing both the Arch and the road should be included.

Since the dirt road which presently goes near the Arch is a relatively little-used road, and under the Project it will be transformed into a heavily used road, we feel that the impact of the road on the Arch is of direct concern to those evaluating the impact of the Kaiparowits development. It is unfortunate that the impact statement for the road (a state project) will be considered separately from the impact statement for the plant. Since the road and plant will be closely related, the environmental assessment of each, particularly as it relates to impacts on Grosvenor Arch, ought to be coordinated and integrated for presentation to the public.

May we compliment your staff on the results of this endeavor and encourage you to consider the value of expanding the EIS in its final form to consider cumulative effects of other energy developments in the Kaiparowits region.

Sincerely,

Orson L. Anderson
Orson L. Anderson
Kaiparowits Resources Subproject
Lake Powell Research Project

Gary D. Weatherford
Gary D. Weatherford
Law Subproject
Lake Powell Research Project

Priscilla P. Grew
Priscilla P. Grew
Kaiparowits Resources Subproject
Lake Powell Research Project

OLA:GDW:PPG:jmv
Distribution given on page 13, attached

IX-477

Mr. Paul Howard

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Orson L. Anderson
Re: Kaiparowits EIS

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cc: Frank Snell, Project Director, Kaiparowits EIS
Ronald L. Little, LPRP
Eric G. Walther, LPRP
Michael D. Williams, LPRP
Gordon C. Jacoby, Jr., LPRP
Owen Olpin, University of Utah School of Law
Jerrold E. Levy, Social Science Coordinator, LPRP

8/4-78



Arizona Representative:

28

Route 8, Box 550-B,
Tucson, Arizona 85710.
Tel.: 602-296-5019.

September 22, 1975.

Mr. Paul L. Howard,
Utah State Director,
Bureau of Land Management,
125 South State Street,
Salt Lake City, Utah 84111.

Subject: Kaiparowits Power Project.

Dear Mr. Howard:

At the public hearing in Phoenix September 17th on the Draft Environmental Impact Statement on this subject, National Parks and Conservation Association presented a condensed summary of its position. As its Arizona Representative, the undersigned submits herewith a more detailed documented substantiation of that position, with the request that it be made part of the official hearing record.

Without repeating NPCA's brief oral testimony in opposition to the Project on environmental grounds, this written statement will be confined to the hydrologic studies and conclusions which appear to dictate abandonment of the Project by the participating companies on economic grounds. NPCA's primary comment on the DEIS, therefore, is that it fails to reveal realistically the deficient water resources on which the success or failure of the Project so critically hinges. Furthermore, by failing to indicate any alternate source of those resources, the DEIS implies that no alternative exists.

The oral testimony, in summary, predicted that the water requirements to be provided from Lake Powell would probably be unavailable after about the year 2005, at which time only 23 years of the planned 35-year payout period would have elapsed. The premises, calculations and data sources on which this conclusion is predicated will be fully detailed herein.

This study was conducted entirely by the writer, who is thoroughly familiar with the subject. He has studied many related documents and has personally inspected the Project site. He has noted the B.Y.U. scientific instrumentation on Nipple Bench, observed one of the coal mine sites on the way up Mann Creek Canyon to the top of Smoky Mountain,

National Parks & Conservation Association, 1701 Eighteenth Street, N.W., Washington, D.C. 20009
telephone (202) 265-2717 printed on recycled paper

and finally drove around the north side of Four-Mile Bench via Paradise Canyon, past Grosvenor Arch and on to Cannonville.

A. Premises Used in NPCA's Studies.

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The following were assumed to be valid premises:

1. The allocation of water of the Colorado River Basin will adhere to provisions of the Colorado River Compact of 1922, as repeatedly endorsed and reaffirmed by the Congress in subsequent legislation.

2. The use of Colorado River water will conform to the order of priority established in Section 6 of the Boulder Canyon Project Act of December 21, 1928, and reaffirmed by the United States Supreme Court on March 9, 1964 in its decree in the case of Arizona vs. California, Section 11 (A), as follows:

- (1) For river regulation, improvement of navigation and flood control;
- (2) For irrigation and domestic uses, including the satisfaction of present perfected rights; and
- (3) For power.

3. Water will be released to Mexico pursuant to the Treaty dated February 3, 1944, without regard to the above priorities, as provided in the same Supreme Court decree.

4. The allocation of water among the states of the Lower Basin will conform to the same Supreme Court decree.

5. Data concerning the volume of virgin flow in the Colorado River at the Compact Point near Lees Ferry, Arizona, as released by the Bureau of Reclamation, are reliable for years subsequent to 1922 when the first gage was installed at the Compact Point.

6. The Central Arizona Project, authorized by Congress in Public Law 90-537, September 30, 1968, will be constructed, at least insofar as the mainstream diversion from Lake Havasu is concerned, and will begin operation in 1985.

7. The five projects in the state of Colorado which are also identified in Public Law 90-537, Title V, Section 501 (b), will be completed as directed concurrently with the Central Arizona Project.

8. To the extent permitted by water availability and by constraints as to water levels required in Lakes Mead and Powell, the Operating Criteria for Hoover and Glen Canyon Dams will be followed, as described in the document issued by the Secretary of the Interior on June 4, 1970, and filed as F.R. Doc. 70-7138, in compliance with the directive con-

tained in Public Law 90-537, Section 602 (a).

B. Water Availability in the Upper Basin.

1. Virgin flow of the Colorado River.

Following through on the first premise, it is necessary first to determine the average annual water availability of the river whole. Unfortunately, the parties to the Colorado River Compact of 1922 were misled in two ways. The recorded history of the virgin flow of the river was derived from inadequate gaging information prior to 1914, and, as will be shown later, the most recent years before 1922 had been unusually wet ones. They were therefore led to predicate their allocation on a supply which subsequent records have shown to be high.

When the Bureau of Reclamation sought authorization of the Central Arizona Project, it testified before the House Committee on Interior and Insular Affairs on January 30, 1958 as to the virgin flow of the river at the Compact Point. It cited averages for three periods:

1931-1967	"Critical period"	12,990 million acre-feet
1922-1967	Actual record at Lees Ferry	13,750 million acre-feet
1905-1967	Longest reliable period of record	14,960 million acre-feet

The noted dendrochronologist, Dr. Charles H. Stockton at the Laboratory of Tree-Ring Research at the University of Arizona, has conducted studies of annual runoff in the Upper Colorado River Basin, as measured by tree ring samples taken at some 30 locations on about 300 trees selected by sophisticated sampling techniques. As shown on Chart A, the period 1905-1929 shows up on the filtered graph to have been the wettest quarter of a century in the last 450 years. In fact, the so-called "critical period" in the Bureau of Reclamation figures above comes remarkably close to the mean of the 450-year Stockton period, and was surpassed in dryness during several extended periods.

By contrast, note the figures on Table A (see Reference 1* for sources) for a 17-year portion of the wet cycle, 1914-1930, indicating an average of 17.84 IAF per year. The data for the earlier portion of that wet cycle, 1905-1913, were not supplied in the referenced source. For these reasons, NECA has elected to use the period 1931-1974 as a fair basis from which to begin. It eliminates the unusual wet cycle which tapered off in 1930, and uses the entire subsequent period of record, which includes both dry and wet years. The figures shown on Table A for this period result in a 44-year average annual virgin flow of 13.271 IAF. This is remarkably close to Dr. Stockton's mean of 13.5 which has a permissible deviation of plus or minus 0.5. (See Reference 1* for sources listed on page 12.)

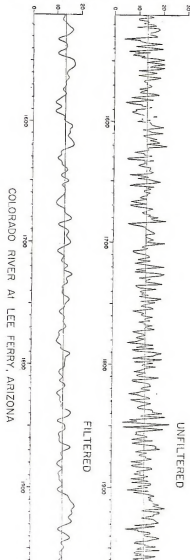
TABLE A

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COLORADO RIVER VIRGIN FLOW AT LEES FERRY (in Millions of Acre-feet)

17-Year Wet Cycle		44-Year Normal Cycle	
Year	IAF	Year	IAF
1914	21,2224	1931	7,7689
1915	14,0279	1932	17,2439
1916	19,2014	1933	11,3569
1917	24,0378	1934	5,6408
1918	15,3641	1935	11,5496
1919	12,4629	1936	13,8009
1920	21,9514	1937	13,7405
1921	23,0155	1938	17,5457
1922	18,3050	1939	11,0792
1923	18,2899	1940	8,6011
1924	14,2017	1941	18,1487
1925	13,0336	1942	19,1261
1926	15,8531	1943	13,1036
1927	18,6166	1944	15,1530
1928	17,2799	1945	13,4110
1929	21,4291	1946	10,4257
1930	14,8857	1947	15,4714
		1948	15,6132
Total	303,2590	1949	16,3760
Average	17,8308	1950	12,8942
		1951	11,6467
		1952	20,6650
		1953	10,6360
		1954	7,6610
		1955	9,1890
		1956	10,7490
		1957	20,0360
		1958	16,4900
		1959	8,6000
		1960	11,3000
		1961	8,5000
		1962	17,3000
		1963	8,5000
		1964	10,2000
		1965	18,9000
		1966	11,2000
		1967	11,9900
		1968	13,6000
		1969	14,4000
		1970	15,4000
		1971	14,8460
		1972	11,9410
		1973	19,3270
		1974	12,8160
		Total	583,9141
		Average	13,2708

ADJUSTED ANNUAL RUNOFF (in MAF)



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ence 2, to be published in the near future.) For the purpose of this study, we will round out the 13.271 to 13.3.

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2. Constraints on Reservoir Operation.

Before proceeding to project future levels of Lake Powell, it is necessary to understand some of the constraints on reservoir operation of it and Lake Mead. For example:

(a) To provide a cushion to prevent extreme floods upstream from inundating lowlands below Hoover Dam, Lake Mead is required whenever possible to maintain a maximum height of 1,219.61 feet above sea level as of the end of each water year, i.e. September 30th. At that point it could still receive 1.5 MAF of floodwater from Lake Powell. Glen Canyon Dam has a similar flood control cushion built into its operation guidelines of approximately 3.45 MAF at September 30th.

(b) Glen Canyon Dam is required by the Compact to release to the Lower Basin at least 75 MAF during each progressively calculated 10-year period, for an annual average of 7.5 MAF; in addition, it must release 0.75 MAF annually as its half share toward meeting the treaty obligation to Mexico, for a total annual average minimum release of 8.25 MAF.

(c) Releases for domestic and agricultural uses in the Lower Basin of water which is surplus to annual consumptive uses in the Upper Basin may not be made when the active storage in Lake Powell is less than that in Lake Mead, except to meet requirements of (b) above. This has the objectives of avoiding spills from Lake Powell and of maintaining, as nearly as practicable, active storage in Lake Mead equal to that in Lake Powell. This obligation is specifically required in Reference 5, Section 602 (a), (3). Chart B illustrates the relative storage levels of the two reservoirs. For sources, see Reference 3.

3. Long-Range Outlook for Lake Powell.

In order to predict the volume and level of water in Lake Powell in future years, adhering as closely as possible to the above constraints, which will be found virtually impossible because of the deficiency in the river's average virgin flow, it is first necessary to project:

- Future annual usages of existing and proposed Upper Basin programs, including shale oil extraction and coal gasification.
- The capacities and annual usages of existing and new reservoirs.
- Annual evaporation by Upper Basin reservoirs.
- Annual releases at Glen Canyon Dam. This must take into consid-

RESERVOIR CAPACITY ALLOCATIONS

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	Lake Mead		Lake Powell	
	Elevation above Streambed at Dam Axis	Quantity in IAF	Elevation above Streambed at Dam Axis	Quantity in IAF
1. Top of Dead Storage (Note 1)	255.0 ft.	2,378	238.0 ft.	1,998
2. Top of Inactive Storage (Note 2)	443.0 ft.	10,024	358.0 ft.	4,126
3. Total of Dead and Inactive Storage		12,402		6,124
4. Active Storage available for joint use; i.e. irrigation, H. & I., satisfaction of existing perfected rights, supplemental awards to Indian reservations by Supreme Court decree, and power production.	579.61 ft.	15,853	545.0 ft.	17,426
5. Sub-total (Note 3)		28,255		23,550
6. Storage space reserved for upstream overflows, needed for flood control, must be released independently of joint use requirements, as of end of water year September 30th; level and amount vary at other times of the water year.	589.0 ft.	1,500	563.0 ft.	3,450
7. Total Capacity		29,755		27,000

NOTES:

- (1) No means of using dead storage
- (2) Releases of "inactive" storage above dead storage are available for river regulation, flood control and navigation, but not for irrigation, H. & I. or power, except for the small amount that may be generated during the prescribed releases.
- (3) The significance of this level is that storage above it must be avoided if possible, and if unavoidable due to unusual upstream floods, should be expeditiously released.

eration the above constraints as well as Lower Basin requirements and Upper Basin availability, not an easy balancing act.

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- (a) Inflows and losses between Glen Canyon Dam and Hoover Dam.
- (f) Consumptive use by Lower Basin states.
- (g) Net losses below Hoover Dam.

Other factors over the horizon could affect the net results, but it would be premature to predict their impact at this time. For example, programs of selective salinity control at certain points of origin are still in the early planning stage, but we can be sure they would reduce the overall water supply. On the other hand, weather modification could increase the supply, but adverse impacts recently experienced by experiments in this field may preclude it as a permanent tool.

4. Upper Basin Projected Consumption.

Table B provides a breakdown of Upper Basin projected consumption according to type of use, starting with published figures for 1974 and extended to the year 2000. Beyond that, in the absence of guidance to the contrary, the use is considered unchanged for study purposes.

The 1974 figures are published in Reference 4, Table 1, page 13. We have revised the data for Livestock Needs and Evaporation, transferring 29,000 acre-feet from this category to Main Stem Reservoir Losses. This is approximately the same proportion of the contents of Fontenelle and Navajo Reservoirs as the 520,000 acre-feet shown for the Main Stem is of the contents of Main Stem reservoirs. We have also revised the 1974 usage in thermal power plants to reflect startup consumption at the Navajo plant at Page and at the San Juan plant, and usage in other plants indicated by the text and tables on pages 30-33 of Reference 4.

Table B-1 details the calculation of projected consumption by thermal power plants. The basis for most of the data is contained in Reference 4, pages 30-33, and in Table 11, page 40. The usage is understated because the potential reallocation indicated on page 43 has not been identified with specific energy projects, while Table B-2 (see below) does reflect the reduced allocation to irrigation projects.

Energy developments listed in Reference 4, Table 11, page 40 are classified as "In progress", "Planned" or "Projected". For purposes of these studies, the phase-in periods for these categories are as follows: "In progress" varies according to known stages of completion and estimates of future expansion schedules; "Planned" usually is

TABLE B-1

ADDITIONAL FUTURE UPPER COLORADO RIVER BASIN WATER REQUIREMENT
FOR FOSSIL-FIRED THERMAL ELECTRIC POWER PLANTS

(In Thousands of Acre-feet)

Plant#:	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	Total
Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	
1974	15	33	5	6	12	6													77
1975	30	33	5	6	12	7													93
1976	34	33	10	6	12	9													104
1977	34	33	10	6	12	9													108
1978	34	33	17	13	12	9				4									149
1979	34	33	18	13	12	9				31	12								162
1980	34	33	25	13	12	18	8		11	31	13				15				217
1981	34	33	25	13	12	18	8	4	11	31	13				15				226
1982	34	33	25	13	12	18	8	4	11	34	13			6	21				247
1983	34	33	25	13	12	18	8	4	11	45	13			6	32				269
1984	34	33	25	13	12	27	8	4	11	45	13			7	45				292
1985	34	41	32	17	12	27	8	4	23	45	13			12	45	30		6	379
1986	34	41	32	17	12	27	8	4	23	45	13			13	45	30		6	380
1987	34	41	32	17	12	27	8	4	23	45	13			13	45	30		6	380
1988	34	41	32	17	12	35	8	4	23	45	13			13	45	30		6	388
1989	34	41	32	17	12	35	8	4	23	45	13			13	45	30		6	388
1990	34	50	32	17	12	35	8	4	23	45	13			13	45	30	60	10	451
1991	34	50	32	17	12	35	8	4	23	45	13			13	45	30	60	10	451
1992	34	50	32	17	12	35	8	4	23	45	13			13	45	30	60	10	451
1993	34	50	32	17	12	35	8	4	23	45	13			13	45	30	60	10	451
1994	34	50	32	17	12	35	8	4	23	45	13			13	45	30	60	10	451
1995	34	50	32	17	12	35	8	4	23	45	13			13	45	30	75	10	466
1996	34	50	32	17	12	35	8	4	23	45	13			13	45	30	75	10	466
1997	34	50	32	17	12	35	8	4	23	45	13			13	45	30	75	10	466
1998	34	50	32	17	12	35	8	4	23	45	13			13	45	30	75	10	466
1999	34	50	32	17	12	35	8	4	23	45	13			13	45	30	75	10	466
2000	34	50	32	17	12	35	8	4	23	45	13			13	45	30	90	10	481

Index to above Plants:

- 1 Navajo, Page, Arizona
- 2 Four Corners, New Mexico
- 3 San Juan, New Mexico
- 4 Huntington Canyon, New Mexico
- 5 Utah Power and Light, Wyoming
- 6 Jin Bridger, Wyoming
- 7 Uncompahgre, Colorado
- 8 Hayden Extension, Colorado
- 9 Craig-Yampa, Colorado
- 10 Kaiparowits, Utah
- 11 North Emery County, Utah
- 12 Escalante-Garfield, Utah
- 13 Fremont I & II, Utah
- 14 Arch Dam, Wyoming
- 15 Northwest Extension, Colorado
- 16 Craig Sinter, Colorado
- 17 South Emery County, Utah
- 18 Pacific Power and Light, Blacks Fork, Wyoming

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USE ALLOCATION OF UPPER COLORADO RIVER WATER
(In Thousands of Acre-Feet)

Plant	Thermal	Fossil	Hydro	Wind	Solar	Geothermal	Coal	Shale	Gill	Sub-	Reservoir
Table	Table	Table	Table	Table	Table	Table	Table	Table	Table	Table	Table
1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974	1974
1975	1975	1975	1975	1975	1975	1975	1975	1975	1975	1975	1975
1976	1976	1976	1976	1976	1976	1976	1976	1976	1976	1976	1976
1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977	1977
1978	1978	1978	1978	1978	1978	1978	1978	1978	1978	1978	1978
1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979
1980	1980	1980	1980	1980	1980	1980	1980	1980	1980	1980	1980
1981	1981	1981	1981	1981	1981	1981	1981	1981	1981	1981	1981
1982	1982	1982	1982	1982	1982	1982	1982	1982	1982	1982	1982
1983	1983	1983	1983	1983	1983	1983	1983	1983	1983	1983	1983
1984	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984	1984
1985	1985	1985	1985	1985	1985	1985	1985	1985	1985	1985	1985
1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986	1986
1987	1987	1987	1987	1987	1987	1987	1987	1987	1987	1987	1987
1988	1988	1988	1988	1988	1988	1988	1988	1988	1988	1988	1988
1989	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989	1989
1990	1990	1990	1990	1990	1990	1990	1990	1990	1990	1990	1990
1991	1991	1991	1991	1991	1991	1991	1991	1991	1991	1991	1991
1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992
1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993	1993
1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
1995	1995	1995	1995	1995	1995	1995	1995	1995	1995	1995	1995
1996	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996	1996
1997	1997	1997	1997	1997	1997	1997	1997	1997	1997	1997	1997
1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998	1998
1999	1999	1999	1999	1999	1999	1999	1999	1999	1999	1999	1999
2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000

R.E. Incorporation of Navajo and Fortenally Reservoirs transferred to Reservoir Losses.

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TABLE B

TABLE B-2

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estimated to start water consumption in 1980, except for projects for which specific comment in the text indicates otherwise, and modified also to reflect extended phase-in when more than one unit is involved; "Projected" has been generally programmed to start water consumption in 1985, except for two small plants in 1990.

Table B-2 reflects future irrigation additions in the Upper Basin, as outlined in Reference 4, Table 13 on page 45. The five Colorado projects included in the CAP authorization legislation are assumed to start phasing in water consumption in 1982, reaching full usage concurrently with the CAP in 1985. The Navajo Indian Project, already under construction, should start operation by 1978 and be fully implemented by 1985. Lyman Project and the Bonneville unit are also under construction and are assumed to phase in from 1980 to 1985. Other authorized projects we have programmed to phase in from 1985 to 1990, non-authorized projects from 1990 to 2000.

Projections of the other uses on Table B are based in general on information contained in the text of Reference 4. Fish and Wildlife and Recreation are discussed on pages 14 to 26, and our projections assume a continuation of the upward trend indicated for the period 1965-1974. The consumptive use projections in Tables 14 and 15 on page 50 were not used because three states had no indications beyond 1980.

Exports, Municipal and Industrial, and Mining uses are discussed on page 44, with minimum and maximum ranges of increase shown for 1980, 1990 and 2000. We have averaged these ranges and applied the indicated annual increase to the 1974 base data. Since there is no analysis of use for Livestock Ponds, we have taken the conservative stance of leaving the 1974 level unchanged during the entire period.

Projections for the totals for Coal Gasification and Oil Shale Extraction were based on data in Reference 4, page 42. The totals of these programs were presumed to be on stream by the year 1995 for Coal Gasification and 2000 for Oil Shale. The water usage growth from 1978 to 2000 was estimated on the basis of Tables 8, 9, 11 and 12, on pages 31, 32, 40, and 41 respectively.

5. Storage Volume in Upper Basin Reservoirs other than Lake Powell.

Table C summarizes the predicted status of Upper Basin reservoirs other than Lake Powell. It presents the details for reservoirs listed in Reference 4, Table 7, page 29, plus subsequent additions. The contents at September 30, 1974 were published by the Bureau of Reclamation.

UPPER BASIN IRRIGATION ADDITIONS FOR FUTURE ADDITIONS

(in Thousands of Acres-feet) Three

Year	Navajo Indian Irrigation Project	Five Colorado Projects	Savery Not Booked	Fruit- Land	Hog- Back	Lyman	Central Utah Pro- jects	Bonne- ville	Yellow Jacket	Lower Yampa	TOTAL
1975	-	-	-	-	-	-	-	13	-	-	13
1976	-	-	-	-	-	-	-	15	-	-	15
1977	-	-	-	-	-	-	-	15	-	-	15
1978	5	-	-	-	-	-	-	15	-	-	20
1979	15	-	-	-	-	-	-	15	-	-	30
1980	35	-	-	-	-	5	-	15	-	-	55
1981	70	-	-	-	-	0	-	15	-	-	93
1982	110	20	-	-	-	15	-	15	-	-	160
1983	160	50	-	-	-	30	-	15	-	-	255
1984	210	100	-	-	-	40	-	15	-	-	365
1985	250	254	4	4	1	50	5	15	-	-	583
1986	250	254	9	8	2	50	10	15	-	-	593
1987	250	254	13	12	4	50	17	15	-	-	615
1988	250	254	16	17	5	50	27	15	-	-	637
1989	250	254	22	22	8	50	36	15	-	-	657
1990	250	5 254	27	26	10	50	44	15	1	-	682
1991	250	10 254	27	26	10	50	44	15	1	-	687
1992	250	15 254	27	26	10	50	44	15	2	-	693
1993	250	20 254	27	26	10	50	44	15	2	-	696
1994	250	25 254	27	26	10	50	44	15	3	-	704
1995	250	30 254	27	26	10	50	44	15	4	1	711
1996	250	35 254	27	26	10	50	44	15	6	1	718
1997	250	40 254	27	26	10	50	44	15	10	1	727
1998	250	45 254	27	26	10	50	44	15	16	1	738
1999	250	50 254	27	26	10	50	44	15	25	1	752
2000	250	50 254	27	26	10	50	44	15	32	2	760

IX-484

STATUS OF UPPER BASIN RESERVOIRS OTHER THAN LAKE AL
(in Millions of Acre-feet)
At End of Water Year

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									Five Colorado Projects Table	
Water Year	Flaming Gorge	Havajo	Blue Larrow Gorge	Point Crystal	Fonte- Green nello	St.	Fuedi	C-1	Total	
1974	3.623	1.024	.690	.112	-	.350	.160	.100	-	6.064
1975	3.669	1.388	.750	.113	-	.350	.160	.100	-	6.530
1976	3.680	1.600	.800	.114	-	.350	.160	.100	-	6.804
1977	3.705	1.650	.850	.115	.030	.350	.160	.100	-	6.960
1978	3.730	1.700	.900	.116	.030	.350	.160	.100	-	7.086
1979	3.750	1.710	.940	.117	.030	.350	.160	.100	-	7.157
1980	3.770	1.710	.940	.115	.030	.350	.160	.100	-	7.178
1981	3.780	1.710	.940	.119	.030	.350	.160	.100	-	7.199
1982	3.790	1.710	.940	.120	.030	.350	.160	.100	.075	7.275
1983	3.790	1.710	.940	.120	.030	.350	.160	.100	.180	7.380
1984	3.790	1.710	.940	.120	.030	.350	.160	.100	.225	7.485
1985	3.790	1.710	.940	.120	.030	.350	.160	.100	.405	7.605
1986	3.790	1.710	.940	.120	.030	.350	.160	.100	.525	7.725
1987	3.790	1.710	.940	.120	.030	.350	.160	.100	.635	7.835
1988	3.790	1.710	.940	.120	.030	.350	.160	.100	.760	7.960
1989	3.790	1.710	.940	.120	.030	.350	.160	.100	.833	8.033
1990	3.790	1.710	.940	.120	.030	.350	.160	.100	.891	8.091
1991	3.790	1.710	.940	.120	.030	.350	.160	.100	.918	8.118
1992	3.790	1.710	.940	.120	.030	.350	.160	.100	.953	8.153
1993	3.790	1.710	.940	.120	.030	.350	.160	.100	.961	8.161

The contents at September 30, 1975 is estimated partly by projecting the reported contents as of August 17, 1975 to reflect normal increase or decrease, partly by assuming that full reservoirs will remain full. All the listed reservoirs are assumed to be full by September 30, 1982.

Table C-1 presents the status of reservoirs comprising the five Colorado projects which were authorized in Reference 5, to be completed concurrently with the Central Arizona Project, which at present has a target date of 1985. Some of these Colorado reservoirs are assumed to start filling in 1982, to permit the projects to start operations in 1986. All these reservoirs should be full by 1993. This represents a total increment of only 1.631 MAF over the storage estimated for September 30, 1975, not an unreasonable expectation considering the size of the Upper Basin surplus in the past.

6. Annual Upper Basin Evaporation Losses.

In 1965, the Colorado Water Conservation Board retained the engineering firm of Tipton and Kalmbach, Inc., of Denver, to study water supplies of the Colorado River. Their report was entered in the record of Reference 1 during testimony by then Governor John A. Love of Colorado. Upper Basin Losses were necessarily included in the Tipton report, and on page 543 of Reference 1 is a brief table showing the estimated evaporation at various Upper Basin storage levels, keyed to corresponding virgin flow levels.

The Tipton level closest to our most probable virgin flow estimate was 13.25 MAF per year, at which point the required storage of 20,388 MAF was estimated to produce evaporation of .550 MAF per year. When we note that total storage at the start of water year 1974 was 25.448 MAF (per Bureau of Reclamation reports, including dead storage), and that evaporation totalled .569 MAF, (520,000 AF per Reference 4, page 13, plus 29,000 from Fontenelle and Havajo Reservoirs), it is apparent that the Tipton evaporation scale in relation to storage contents is too high, but usable if adjusted by a factor of 80.09% for the discrepancy experienced. The Tipton scale indicates that the percent evaporation of 2.69766% at the 20,388 MAF level drops to 2.31834% at the next step on the scale, namely 35,370 MAF, a decline of .37932%.

Based on these data, the method of computing the adjusted evaporation for any amount of storage for any year is as follows:

- From total storage at start of year deduct the Tipton base of 20,388 MAF, and divide the remainder by 20,388 to obtain the percentage

TABLE C-1

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STATUS OF RESERVOIRS OF
FIVE COLORADO PROJECTS AUTHORIZED WITH CAP

(in Millions of Acre-feet)

At End of Water Year

Water Year	Animas- La Plata Project	West Divide Project	Dallas Creek Project	Dolores Project	San Miguel Project	Total
1982	.020	.010	.015	.030	-	.075
1983	.050	.025	.030	.060	.015	.180
1984	.075	.040	.050	.090	.030	.285
1985	.100	.060	.075	.120	.050	.405
1986	.125	.080	.100	.155	.065	.525
1987	.150	.100	.120	.190	.075	.635
1988	.175	.120	.140	.240	.085	.760
1989	.200	.122	.146	.270	.095	.833
1990	.203	.123	.146	.300	.107	.881
1991	.203	.123	.155	.330	.107	.916
1992	.203	.123	.160	.350	.107	.953
1993	.203	.123	.164	.364	.107	.961

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increase above the Tipton base.

(b) Multiply by .37932% to obtain the percent reduction in evaporation from Tipton's percent.

(c) Subtract result from Tipton's 2.6977% at the 20,388 IAF level.

(d) Multiply by adjustment factor of 80.08%. The result is the correct rate of evaporation for the ensuing year.

(e) Multiply the evaporation rate by the storage volume at the start of the year to obtain evaporation for the year.

Table B shows the application of the above method to each year's storage during the study period, and the resultant evaporation. The theory expressed in the Tipton scale is that not only does the amount of evaporation increase or decrease with the size of the reservoir, but the rate of evaporation declines as the size increases, due to a relative decrease of surface area in proportion to the volume. We agree this must be so, but the extent of this impact is less pronounced in shallower bodies than in deep ones with steep walls. The effect of making this calculation as shown in Table B does not appear to be significant enough in the change in rate to have a substantial bearing on the results of the study. Therefore, when we will be calculating the evaporation on Lake Mead later, we will use a uniform rate.

7. Releases and Diversions from Lake Mead and the Lower Colorado River.

Table B shows Lower Basin consumption. Actual known data for 1974 are shown for deliveries to Mexico, Arizona and the Total. These come from the Bureau of Reclamation. The total figure is the amount released by Hoover Dam plus diversions by pumping from Lake Mead to Nevada. The Nevada series reflects continuation of the current trend of increased use. The California series starts with the actual 1974 amount contained in a letter to George Barr from William H. Wheeler, Chairman of the Arizona Water Commission, dated March 17, 1975. It is assumed that California will continue taking approximately that amount until 1982, when it will start curtailing until in 1985, when the CAP goes on stream, it reaches the level of 4.4 IAF guaranteed by the Supreme Court decree.

The remaining column, Net Losses below Hoover Dam, in 1974 is the balance left after deducting the other columns from the total. The Bureau of Reclamation, in testimony before the House Committee on Interior and Insular Affairs on January 30, 1968, asserted that it planned salvage operations which would reduce those losses to .590 IAF. Assum-

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CALCULATION OF UPPER BASIN EVAPORATION RATE
AND AQUIF OF EVAPORATION LOSS
(in Millions of Acre-feet)

Year	Total Storage at Start of Year	Deduct 20,368 AF	Divide by 20,383	Multiply by 3,7932%	Subtract from 2,6977%	Multiply by 80.05%	Total Releases
1975	26,072	5,664	2,7079	1,050%	2,5919%	2,0759%	5,962
1976	28,458	8,070	3,9582	1,501%	2,5476%	2,0404%	5,000
1977	28,456	8,070	3,9582	1,501%	2,5476%	2,0404%	5,000
1978	29,083	9,195	4,5100	1,711%	2,5266%	2,0236%	5,000
1979	29,578	9,190	4,5075	1,710%	2,5267%	2,0236%	5,000
1980	30,002	9,614	4,7155	1,709%	2,5188%	2,0173%	5,000
1981	30,302	9,914	4,8627	1,8445%	2,51325%	2,0129%	5,000
1982	30,495	10,107	4,9573	1,883%	2,5097%	2,0100%	5,000
1983	30,672	10,284	5,0441	1,913%	2,5054%	2,0074%	5,000
1984	30,609	10,301	5,0325	1,9165%	2,50605%	2,0071%	5,000
1985	30,528	10,140	4,9735	1,8655%	2,50905%	2,0095%	5,000
1986	30,005	9,617	4,7170	1,769%	2,5186%	2,0173%	5,000
1987	29,426	9,040	4,4540	1,682%	2,5205%	2,0255%	5,000
1988	28,798	8,410	4,1250	1,555%	2,5412%	2,0352%	5,000
1989	28,097	7,709	3,7611	1,434%	2,5543%	2,0457%	5,000
1990	27,336	6,950	3,4089	1,293%	2,5684%	2,0570%	5,000
1991	26,453	6,065	2,9748	1,128%	2,5809%	2,0702%	5,000
1992	25,726	5,340	2,6192	1,0295%	2,59835%	2,0810%	5,000
1993	25,104	4,716	2,3131	0,937%	2,6100%	2,0903%	5,000
1994	24,431	4,043	1,9830	0,832%	2,6223%	2,1004%	5,000
1995	23,709	3,321	1,6289	0,681%	2,6359%	2,1111%	5,000
1996	22,870	2,462	1,2174	0,462%	2,6515%	2,1236%	5,000
1997	21,939	1,601	0,7353	0,296%	2,6679%	2,1367%	5,000
1998	21,065	677	0,3321	0,126%	2,6851%	2,1509%	5,000
1999	20,102	-	-	-	2,6977%	2,1659%	5,000
2000	19,105	-	-	-	2,6977%	2,1606%	5,000
2001	18,067	-	-	-	2,6977%	2,1606%	5,000
2002	17,052	-	-	-	2,6977%	2,1606%	5,000
2003	16,037	-	-	-	2,6977%	2,1606%	5,000
2004	15,066	-	-	-	2,6977%	2,1606%	5,000
2005	14,115	-	-	-	2,6977%	2,1606%	5,000
2006	13,185	-	-	-	2,6977%	2,1606%	5,000
2007	12,275	-	-	-	2,6977%	2,1606%	5,000
2008	11,385	-	-	-	2,6977%	2,1606%	5,000
2009	10,514	-	-	-	2,6977%	2,1606%	5,000
2010	9,662	-	-	-	2,6977%	2,1606%	5,000

TABLE D

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RELEASES AND DIVERSIONS FROM LAKE MEAD AND
FERNANDO RIVER BELOW HOOVER DAM
(in Millions of Acre-feet)

(In Millions of Acre-Feet)						
	Per Treaty with Mexico	Net Losses below Hoover Dam	Consumptive Use by Lower Basin			Total Releases
Year	Mexico	Dam	Arizona	Nevada	California	
1974	1,538	1,057	1,181	.095	5,062	8,933
1975	1,500	1,028	1,192	.098	5,000	8,318
1976	1,500	.999	1,202	.102	5,000	8,803
1977	1,500	.969	1,213	.105	5,000	8,787
1978	1,500	.940	1,224	.109	5,000	8,773
1979	1,500	.911	1,234	.112	5,000	8,757
1980	1,500	.882	1,245	.116	5,000	8,743
1981	1,500	.853	1,256	.119	5,000	8,728
1982	1,500	.823	1,267	.123	4,900	8,613
1983	1,500	.794	1,277	.126	4,800	8,497
1984	1,500	.765	1,288	.129	4,600	8,282
1985	1,500	.735	1,299	.133	4,400	9,569
1986	1,500	.707	1,309	.136	4,400	9,543
1987	1,500	.678	1,320	.140	4,400	9,518
1988	1,500	.648	1,331	.143	4,400	9,228
1989	1,500	.619	1,342	.147	4,400	9,012
1990	1,500	.590	1,353	.150	4,400	8,797
1991	1,500	.560	1,364	.153	4,400	8,600
1992	1,500	.530	1,375	.157	4,400	8,394
1993	1,500	.500	1,387	.160	4,400	8,177
1994	1,500	.500	1,387	.163	4,400	8,100
1995	1,500	.500	1,387	.167	4,400	8,114
1996	1,500	.500	1,387	.170	4,400	8,317
1997	1,500	.500	1,387	.173	4,400	8,520
1998	1,500	.500	1,387	.177	4,400	8,524
1999	1,500	.500	1,387	.180	4,400	8,527
2000	1,500	.500	1,387	.183	4,400	8,530
2001	1,500	.500	1,387	.187	4,400	8,534
2002	1,500	.500	1,387	.190	4,400	8,537
2003	1,500	.500	1,387	.193	4,400	8,540
2004	1,500	.500	1,387	.197	4,400	8,544
2005	1,500	.500	1,387	.200	4,400	8,547
2006	1,500	.500	1,387	.203	4,400	8,550
2007	1,500	.500	1,387	.207	4,400	8,554
2008	1,500	.500	1,387	.210	4,400	8,557
2009	1,500	.500	1,387	.213	4,400	8,560
2010	1,500	.500	1,387	.217	4,400	8,564

TABLE E

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ing it takes until 1990 to accomplish this, we have shown gradual annual incremental reductions in the interval.

For Arizona, we have had to make allowances, mostly for CAP and for increased use by Indian reservations along the river. The calculations started on the following basis: (all figures in MAF)

Perfect rights with priority over CAP	1.186
Use by reservations along the river in Arizona:	
Allotted by Supreme Court decree	.7616
Approximate present use	.430
Potential addition	.3316
Assume only 50% will be added, none after 1990	.166
Total priority use by 1990	1.352
Used in 1974	1.191
Increase from 1974 to 1990	.171
Annual increase (average)	.0106875

By 1985, these annual increases will have reached .1175625 MAF. This will permit CAP to have an initial flow of 1.5013 MAF, to bring the Arizona total to the Supreme Court allotment of 2.8 MAF. In succeeding years, CAP would be slightly reduced to offset the Indian increases until 1990. However, by 1988 it will become apparent that a persistent decline in Lake Mead's active storage, combined with the prospect of reduced releases from Lake Powell in coming years, will dictate progressive cutbacks in CAP usage. From 1992 on, we have it pegged at .500 MAF, of which 20% is reserved for irrigation use on Indian reservations. This was established by the Secretary of the Interior in a ruling published in the Federal Register April 18, 1975. Despite this CAP reduction, Lake Mead storage will continue to decline, and it is questionable whether the availability of only .400 MAF for municipal and industrial users will be sufficient to meet Project repayment requirements. In any event, the CAP will have become useless in the struggle to balance Arizona's water budget.

8. Status of Lake Mead Storage.

Table F summarizes the effect of all factors on the level of Lake Mead storage. Losses between Glen Canyon and Hoover Dams are calculated at 3.77% of the storage at the start of each water year. This is based on evaporation and storage data for 1974 published by the U. S. Geological Survey, using data of the Bureau of Reclamation.

Inflows between the two dams are based on studies reported by

(28)

TABLE F (28)

		ST (Millions of acre-feet)		(OF LAKE MEAD STORAGE)				Contents at end of Year	
x 3.77% =						Releases			
Contents of Losses		Inflows		Lees		from		Total	
Lake Inflow		Lees		Ferry		Lake Mead		Included	
Water at Start		from Glen		to Hoover		(from		Lead	
Year	of Year	to Hoover	from Glen	to Hoover	from Glen	to Hoover	(from	Storage	Active
Year	of Year	to Hoover	from Glen	to Hoover	from Glen	to Hoover	(from	Storage	Storage
1974	22.554	.850	.236	.699	8.933	21.736	9.334		
1975	21.736	.819	.155	.820	8.818	20.074	7.672		
1976	20.074	.757	.9416	.820	8.803	20.750	8.348		
1977	20.750	.782	8.750	.820	8.787	20.751	8.349		
1978	20.751	.782	8.750	.820	8.773	20.766	8.364		
1979	20.766	.783	8.750	.820	8.757	20.796	8.394		
1980	20.796	.784	8.750	.820	8.743	20.839	8.437		
1981	20.839	.736	8.750	.820	8.728	20.995	8.493		
1982	20.895	.785	8.600	.820	8.613	20.914	8.512		
1983	20.914	.788	8.600	.820	8.497	21.049	8.647		
1984	21.049	.794	8.600	.820	8.282	21.393	8.991		
1985	21.393	.805	8.600	.820	9.569	20.438	8.036		
1986	20.438	.771	8.600	.820	9.546	19.594	7.142		
1987	19.594	.737	8.600	.820	9.518	18.709	6.307		
1988	18.709	.795	8.600	.820	9.228	18.196	5.794		
1989	18.196	.886	8.600	.820	9.012	17.918	5.516		
1990	17.916	.676	8.600	.820	8.787	17.885	5.463		
1991	17.885	.674	8.400	.818	8.600	17.700	5.298		
1992	17.809	.671	8.250	.816	8.506	17.590	5.188		
1993	17.700	.667	8.250	.814	8.507	17.590	5.188		
1994	17.590	.663	8.250	.812	8.510	17.479	5.077		
1995	17.479	.659	8.250	.810	8.514	17.366	4.964		
1996	17.365	.655	8.250	.808	8.517	17.252	4.850		
1997	17.252	.650	8.250	.806	8.520	17.138	4.736		
1998	17.138	.646	8.250	.804	8.524	17.022	4.620		
1999	17.022	.642	8.250	.802	8.527	16.905	4.503		
2000	16.905	.637	8.250	.800	8.430	16.788	4.386		
2001	16.788	.633	8.250	.799	8.534	16.670	4.223		
2002	16.670	.628	8.250	.798	8.537	16.553	4.151		
2003	16.553	.624	8.250	.797	8.540	16.436	4.034		
2004	16.436	.620	8.250	.796	8.544	16.318	3.916		
2005	16.318	.615	8.250	.795	8.547	16.201	3.799		
2006	16.201	.611	8.250	.794	8.550	16.084	3.682		
2007	16.084	.606	8.250	.793	8.554	15.967	3.565		
2008	15.967	.602	8.250	.792	8.557	15.850	3.448		
2009	15.850	.598	8.250	.791	8.560	15.733	3.331		
2010	15.733	.593	8.250	.790	8.564	15.616	3.214		

Wesley E. Steiner, Executive Director of the Arizona Water Commission in a memorandum to the Commissioners dated March 11, 1975. The 1974 records of existing gaging stations plus estimates for tributaries lacking gages do not confirm as large an inflow as Mr. Steiner claims, but we use his figures except for 1974. The latter amount is derived by subtracting the total of other known sources from known usages.

9. Status of Lake Powell Storage.

Table G summarizes the effect of all factors on the level of Lake Powell storage. Used in conjunction with Table F, the amount to be released to the Lower Basin each year is determined, with every effort being made to remain within the constraints previously outlined. The amount released in 1974 is the actual figure published by the Bureau of Reclamation, and that for 1975 is a projection of the amount known to have been already released as of August 17, 1975. All calculations from 1975 on are based on an assumed annual virgin flow of 13.3 MAF.

Due to Lake Powell's close approach to its flood control ceiling in 1983, and due also to the substantial excess of active storage in Lake Powell over that in Lake Mead, we try to correct for the imbalance as long as possible by releasing amounts greater than the 8.25 MAF minimum. However, by 1991 we find that inroads on Lake Powell's storage have persisted so long, as result of increased Upper Basin consumption and the filling of new Upper Basin reservoirs, that retrenchment to the 8.25 MAF minimum release by 1992 is dictated.

But the damage has already been done, by having authorized more projects than can be supported. Lake Powell's active storage continues to plunge downward and disappears completely by 2004. At that point, all uses become subordinate to control of river flow, and to meeting Compact obligations. Also at that point, the lake's surface drops below the level of the Kaiparowits intake tunnel. Also stopped would be power generation at the Navajo plant. Some power can still be generated at Glen Canyon Dam incidental to the small releases, but even this stops during 2010 when dead storage is reached.

A brief respite can be gained by releasing permissible amounts from other Upper Basin reservoirs. Also, consumptive usage would have declined by stopping diversions to projects depending on Lake Powell. But on the other hand, remember that we had stopped increasing the estimated consumptive usage after the year 2000, which may have been too conservative. In reality it probably would have had some increase.

STATUS OF LAKE POWELL STORAGE

(in Millions of Acre-feet)

TABLE G

Water Year	Storage at Start of Year	Add Virgin Flow	Consumptive Use				Storage at End of Water Year			Total Upper Basin
			Evaporation	Diversion	Leases	to Lower Basin	Lake Powell Total Storage	Active Storage	Minus 6.124 MAF Others	
Year	Year	Year	Year	Year	Year	Year	Year	Year	Year	Year
1974	25,268	12,816	.549	3.197	8,266	20,008	13,884	6,064	26,072	
1975	26,072	13.3	.541	3,258	7,155	21,928	15,804	6,530	28,458	
1976	28,458	13.3	.581	3,303	9,416	21,654	15,530	6,804	28,458	
1977	28,453	13.3	.581	3,344	8,750	22,123	15,999	6,960	29,083	
1978	29,083	13.3	.589	3,466	8,750	22,402	16,368	7,086	29,578	
1979	29,578	13.3	.599	3,527	8,750	22,845	16,721	7,157	30,002	
1980	30,002	13.3	.605	3,645	8,750	23,124	17,000	7,178	30,302	
1981	30,302	13.3	.610	3,747	8,750	23,306	17,182	7,189	30,495	
1982	30,495	13.3	.613	3,910	8,600	23,397	17,273	7,275	30,672	
1983	30,672	13.3	.616	4,067	8,600	23,309	17,185	7,380	30,689	
1984	30,689	13.3	.615	4,245	8,600	23,043	16,919	7,485	30,528	
1985	30,528	13.3	.613	4,610	8,600	22,400	16,276	7,605	30,005	
1986	30,005	13.3	.605	4,672	8,600	21,703	15,579	7,725	29,423	
1987	29,428	13.3	.595	4,734	8,600	20,263	14,839	7,835	28,798	
1988	28,798	13.3	.585	4,815	8,600	20,137	14,031	7,950	28,097	
1989	28,097	13.3	.575	4,834	8,600	19,305	13,181	8,033	27,338	
1990	27,338	13.3	.562	5,233	8,600	18,372	12,248	8,081	26,453	
1991	26,453	13.3	.543	5,077	8,600	17,610	11,466	8,118	25,728	
1992	25,728	13.3	.535	5,139	8,250	16,951	10,827	8,153	25,104	
1993	25,104	13.3	.525	5,198	8,250	16,270	10,146	8,161	24,341	
1994	24,341	13.3	.513	5,259	8,250	15,548	9,424	8,161	23,709	
1995	23,709	13.3	.501	5,388	8,250	14,709	8,585	8,161	22,870	
1996	22,870	13.3	.486	5,445	8,250	13,828	7,704	8,161	21,999	
1997	21,939	13.3	.479	5,504	8,250	12,904	6,780	8,161	21,085	
1998	21,085	13.3	.453	5,560	8,250	11,961	5,817	8,161	20,192	
1999	20,102	13.3	.434	5,613	8,250	10,944	4,820	8,161	19,105	
2000	19,105	13.3	.413	5,675	8,250	9,906	3,782	8,161	18,067	
2001	18,067	13.3	.390	5,675	8,250	8,891	2,767	8,161	17,032	
2002	17,022	13.3	.368	5,675	8,250	7,875	1,752	8,161	16,037	
2003	16,037	13.3	.346	5,675	8,250	6,905	.781	8,161	15,066	
2004	15,066	13.3	.326	5,675	8,250	5,954	-.170	8,161	14,115	
2005	14,115	13.3	.305	5,675	8,250	5,024	-1,100	8,161	13,185	
2006	13,185	13.3	.285	5,675	8,250	4,114	-2,010	8,161	12,275	
2007	12,275	13.3	.265	5,675	8,250	3,224	-2,900	8,161	11,385	
2008	11,385	13.3	.246	5,675	8,250	2,353	-3,771	8,161	10,514	
2009	10,514	13.3	.227	5,675	8,250	1,501*	-4,623	8,161	9,662	
2010	9,662	13.3	.209	5,675	8,250	.667*	-5,437	8,161	8,828	

*Note: It is impossible for Lake Powell to drop below dead storage level of 1,998 MAF. These are theoretical figures only.

C. Alternatives.

The gloomy picture just completed will of course stimulate a search for alternatives. The Kaiparowits consortium might want to set their intake tunnel at a deeper level, but this would violate the Supreme Court decree that power generation has the lowest order of priority in times of scarcity. Besides, it wouldn't solve anything.

Undoubtedly, long before this dire emergency comes to pass, the Upper Basin states will seek revision of the 1922 Compact to equalize the allocation between the two basins. There will be strong opposition by those whose supply would be curtailed, notably the few remaining GNP customers. Relief would be justified on the basis of the vital concern for energy, and the need to exploit shale oil and coal gasification. But it still wouldn't balance the water budget.

Weather modification was mentioned earlier, as a device to increase snow pack west of the Continental Divide. This also would have its opponents. The growing season there is already very short, and local farmers, ranchers and perhaps timber interests would be severely hurt. And east of the Divide, increased irrigation in recent years has started to diminish groundwater, just like in Arizona. Artificially adding to Colorado Basin runoff would increase the impact in the plains states.

There remains the possibility of inter-basin transfers. As we know, the GWP legislation places a 10-year moratorium on such discussions, expiring in 1978. But before we consider that, it would be opportune to consider more efficient use of the resources we have. Selective spot irrigation could save a great deal. States like Arizona should institute water law reforms which would establish controls heretofore absent. Shifting crop production away from areas where water is inadequate could be a partial solution. Certainly any revival of inter-basin transfer proposals will evoke vigorous hostility in the Columbia basin, and we can expect a long battle with questionable chances of success.

D. Conclusions.

The Kaiparowits Project is planned to pay off over a 35-year period. NECA's studies show that, barring major policy changes which will take a long time to effect, Lake Powell will probably fail to provide the required water beyond about 23 years. With luck, another wet cycle could occur during the interval to rescue it, but according

to the Stockton data, as we have seen, the odds are 17 to 1 against it. Worse yet, examination of the Stockton chart reveals that the likelihood of an even drier cycle than that of the past 44 years is somewhat greater than that of a wet cycle, putting even the 23-year operational period into serious jeopardy. The participating companies will be gambling at long odds not only on losing their multi-billion dollar investment, but on an extended period of reduced revenues for which they will be unprepared to compensate with alternate sources of power.

NECA feels strongly that the adverse environmental impacts contained in the EIS are too high a price to pay for a Project which is subject to the very questionable economic viability demonstrated in this study. Rejection of the proposal is respectfully urged.

Sincerely yours,

Robert L. Goshland
Robert L. Goshland,
Arizona Representative.

References:

1. "Memorandum Before the Subcommittee on Water and Power Resources of the Committee on Interior and Insular Affairs, United States Senate, May 2-3, 1967, subject Central Arizona Project. Virgin flow at Lees Ferry was obtained partly from this source, for the years 1914-1932 from testimony of Floyd A. Smith, then Commissioner of the Bureau of Reclamation, page 296; and for the years 1939-1974 from the Bureau of Reclamation, Phoenix office.
2. "Long-term streamflow reconstruction in the Upper Colorado River Basin Using Snow Data", by Charles L. Stockton, Ph.D., Laboratory of Snow-Ming Research, University of Arizona, Tucson 85721. (Paper delivered at Seminar on Colorado River Basin Modeling Studies, July 16-18, 1975, Utah State University, Logan, Utah. To be published as "Proceedings" in the near future.)
3. "Lake Lead Area and Capacity Tables", Bureau of Reclamation Region 3, April 1967; and "Lake Powell Area and Capacity Tables", Bureau of Reclamation Region 4, April 1966.
4. "Report on WATER FOR ENERGY in the UPPER COLORADO RIVER BASIN", U. S. Department of the Interior, Water for Energy Management Team, July 1974.
5. "The Colorado River Basin Project Act", Public Law 90-537 dated September 30, 1968, which authorized, among other provisions, the construction of the Central Arizona Project.

BOX 157
BLACK CANYON RANCH
BLACK CANYON STAGE
PHOENIX, ARIZONA 85020
TELEPHONE 602 465 7878

30

September 15, 1975

Mike Johnson
Box 117
Valley Center
Phoenix, Az.

Dear Mr. Johnson,

I greatly appreciate

the opportunity to speak with you before the afternoon session of the Kaiparowits hearing. Yesterday after my oral testimony you asked me several questions concerning the planning done by the Pima-Six District for the Black Canyon Planning Unit. One point I forgot to mention was that the Salt Lake in question from what I have seen established in the Black Canyon Unit is not only a scenic buffer zone, but also been established along the Agua Fria River. The scenic zone would exclude any scenic or surface intrusion. If the mineral survey of the area will be closed as prohibited, therefore road vehicles use will be prohibited. Therefore it seems that any crossing of the Agua Fria would also violate this planning to

Thank you

Shirley McKennis

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ARIZONA AUDUBON COUNCIL

Tucson Audubon Society, Maricopa Audubon Society, Northern Arizona Audubon Society, Huachuca Audubon Society, Yuma Audubon Society

September 22, 1975

Kaiparowits D.E.I.S.

Further written response - in addition to oral and written comments submitted on Sept 17, 1975 in Phoenix, Az. at the public hearings

At this time the Arizona Audubon Council has a further written response to the Kaiparowits D.E.I.S.. The Black Canyon Planning Unit of the Bureau of Land Management has designated a scenic buffer zone along the Agua Fria River. Scenic and surface intrusions will be prohibited as will mineral entry. Off road vehicle use will be restricted to designated roads. The Agua Fria Alternate Transmission Route would violate this existing planning if implemented.

The Agua Fria River, that portion downstream of Rock Springs, provides the necessary habitat to support the existence of the black hawk-buteo galus anthracinus - of which there are currently estimated to be less than 150 breeding pairs in the United States. The Agua Fria Alternate would have devastating impacts upon the suitability of the lower Agua Fria River to support a black hawk population of any size.

The draft statement does not deal with the problem of air pollution on a cumulative level, in regards to the Four Corners Region as defined by the Environmental Protection Agency. It is impossible to measure the effects of Kaiparowits upon the Colorado Plateau without studying the emissions of all present and proposed coal generating plants in the area and their effects upon air quality as a whole.

The Arizona Audubon Council feels strongly that the figures used by the utilities in determining future electrical needs in the areas they serve are grossly exaggerated. The last several years have seen a much smaller increase of electrical consumption than the historic rate upon which the utilities base their demands. The Arizona Audubon Society at this time submits a copy of an article which appeared in the September 1975 edition of the Audubon Magazine. The technology presently exists to implement many varied kinds of energy saving devices and building techniques. Much of the future energy demand growth will result from the construction of new buildings. It is in the construction of new buildings that the greatest use of energy saving techniques will be made. This, together with new pricing systems such as "peak load pricing" would enable energy demand growth to be slowed drastically.

Sincerely, Shirley McKennis

Greg McKennis, representing Arizona Audubon Council

Box 187 Black Canyon Stage
Phoenix, Arizona 85020

IX-491

Audubon MAGAZINE
SEPT 1975

Architecture, energy economy, and efficiency

While President Ford and Congress have been engaged in a titanic and well reported squabble over competing plans to reduce oil consumption by one million barrels a day by the end of the year and conserve eight million barrels of oil per day by 1985, the American Institute of Architects has announced a considerably less provocative, less costly proposal that could reduce oil consumption by more than 12.5 million barrels a day by 1980.

What's more, these savings would be accomplished by more efficient energy use in only one sector of the energy market—the heating, cooling, and lighting of buildings.

Existing buildings, the architects say, could be converted to reduce energy consumption from 10 to 50 percent by installing solar ponds to capture and generate energy at the building site and provide part of the power needs. This, plus further conservation by adding insulation, installing sunshades, windows, energy-absorbing glazing, reducing lighting, and utilizing what is now waste heat, would cut a building's need for power supplied by traditional public utilities.

Along with this retooling of existing

buildings, new structures would be designed to include these features and would be 60 percent more energy efficient than present ones.

The American Institute of Architects proposes its plan in a report titled "A Nation of Energy Efficient Buildings by 1980," produced by AIA's energy steering committee, which was organized to "explore the relationship between energy and the built environment." None of this daily energy saving, equivalent to more than ten times the capacity of the trans-Alaska oil pipeline, would require any "Black Box" technology, the report says, nor would it make for a less comfortable building environment.

The economic advantages of the plan are fascinating. At first, the cost seems staggering: To convert present buildings by 1980, from \$729 billion to \$1,460 billion, that's almost from flat to the cost of nuclear fission. But the cost of nuclear fission could be saved—\$929 billion to \$1,699 billion (depending on fuel-price increases)—and the capital investment (\$415 billion) that otherwise would be required to generate the "saved" energy.

Using various "scenarios" (combinations of increasing energy-cost rates and incremental costs of building energy-efficient buildings), the report shows that actual working capital requirements would range from \$86 billion to \$368 billion, or from considerably less than to only slightly more than the cost of building the additional necessary energy supply facilities.

Environmentally, the advantages would include the need for fewer nuclear plants, open pit coal and oil shale mines, offshore oil wells, and refineries and pipelines, and considerably less air and thermal pollution. —GARY SOREN



WILLIAM C. WADE
EXECUTIVE DIRECTOR

TO:

Northern Arizona Council of Governments

P.O. BOX 97 * FLAGSTAFF, AZ * 86001 * (602) 774-1899

Regional A-95 Review

Mr. Robert Deeman
State Clearinghouse (A-95)
1645 West Jefferson, Suite 428
Phoenix, AZ 85007

RE: Project: Dept. of Interior, Bureau of Land Management
DRAFT - Kaiparowits Power Plant
S.A.I. #: 75-80-0035

The Northern Arizona Council of Governments (NACOG) has completed its A-95 Review and Comment upon the above project. Action taken on this project notification is as follows:

- ☐ Proposal supported as described on the AZ-189 and any attachments.
- ☐ Proposal is supported with certain recommendations, provisions, etc.
- ☒ No comment on the power plant itself; however we wish to note that the procedure is wasteful since it will result in the duplication public facilities where adequate public facilities already exist within a reasonable distance.
- ☐ Proposal is not supported.

Please be aware that NACOG reserves the prerogative of making additional comments should new information become available to the Agency.

The Northern Arizona Council of Governments has appreciated this opportunity to review and comment on this project.

Thank you.

Manuel F. Acosta
Manuel F. Acosta, Asst't Director for
William C. Wade
Executive Director

Date: 9-23-75

THIS A-95 REVIEW IS SUPPLIED IN PART BY A HUD JOI PLANNING GRANT.

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COVER SHEET for FEDERAL GRANT APPLICATION/WARD NOTIFICATION ARIZONA

1. APPLICANT - Organizational Unit Dept. of Interior, Bureau of Land Mgmt.		14. ADDRESS - Street or P.O. Box P.O. Box 11505		1. APPLICATION DATE 19 <u>75</u> <u>09</u> <u>28</u>	
2. CITY Salt Lake City		3. STATE & ZIP CODE Utah 84111		2. FEDERAL AGENCY BUREAU OF LAND MANAGEMENT	
5. TYPE OF ACTION <input checked="" type="checkbox"/> New <input type="checkbox"/> Modification <input type="checkbox"/> Continuation		6. TYPE OF CHANGE (Change of Title or 10% or more change) <input type="checkbox"/> Increased Dollars <input type="checkbox"/> Increased Duration <input type="checkbox"/> Decreased Dollars <input type="checkbox"/> Decreased Duration		7. FINDING (FEDERAL AGENCY) <input type="checkbox"/> Other Scope Change <input type="checkbox"/> Cancellation	
15. REQUESTED FUND START 19 <u>75</u> <u>09</u> <u>28</u>		16. APPLICANT TYPE Enter Letter A. State F. School District B. Interstate G. Community Action Agency C. COG H. Sponsored Organization D. County I. Indian E. City J. Other		17. FUND REQUESTED (For Change Only) Amt. of Inc. (d) or Dec. (d)	
15. FUNDS DURATION 19 <u>75</u> <u>09</u> <u>28</u>				20. FEDERAL GRANT 1.1% <u>00</u>	
17. EST. PROJECT START 19 <u>75</u> <u>09</u> <u>28</u>				21. FEDERAL LOAN 1.1% <u>00</u>	
18. EST. PROJECT DURATION 19 <u>75</u> <u>09</u> <u>28</u>				22. STATE 1.1% <u>00</u>	
19. EST. PROJECT DURATION 19 <u>75</u> <u>09</u> <u>28</u>				23. LOCAL 1.1% <u>00</u>	
20. EST. PROJECT DURATION 19 <u>75</u> <u>09</u> <u>28</u>				24. OTHER 1.1% <u>00</u>	
21. EST. PROJECT DURATION 19 <u>75</u> <u>09</u> <u>28</u>				25. TOTAL 1.1% <u>00</u>	
22. EST. PROJECT DURATION 19 <u>75</u> <u>09</u> <u>28</u>					
23. EST. PROJECT DURATION 19 <u>75</u> <u>09</u> <u>28</u>					
24. EST. PROJECT DURATION 19 <u>75</u> <u>09</u> <u>28</u>					
25. EST. PROJECT DURATION 19 <u>75</u> <u>09</u> <u>28</u>					
26. PROJECT ABSTRACT (800 Characters Per Line - 5 Lines; Attach 1-2 Page Project Summary for Review) Proposed construction and operation of a 3,000mw generating plant, four coal mines and all support facilities, limestone quarry, transmission system, access roads, new highway and new town.					
27. AREA OF PROJECT IMPACT (Indicate City, County, State, etc.) Kaiparowits Plateau in Southern Utah					
28. CONGRESSIONAL DISTRICT Of Applicant Districts Impacted By Project					
29. NAME OF CONTACT PERSON Paul Horned, State Director					
30. ADDRESS - Street or P.O. Box 125 S. State Street, Salt Lake City 84111					
31. STATE AGENCIES ONLY WILL PROJECT REQUIRE NEW POSITION					
32. MATCHING RATIO FEDERAL STATE LOCAL					
33. ACTION TAKEN <input checked="" type="checkbox"/> Multiple <input type="checkbox"/> Single <input type="checkbox"/> Waived <input type="checkbox"/> Unavailable					
34. ACTION BASED ON REVIEW OF <input checked="" type="checkbox"/> Application <input type="checkbox"/> Modification <input type="checkbox"/> Continuation					
35. CLEARINGHOUSE IDENTIFIER (SAIL) A 12 75800035					
36. STATE PLAN REQUIRED <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No					
37. FINAL CLEARINGHOUSE ACTION DATE 19 <u>75</u> <u>09</u> <u>28</u>					



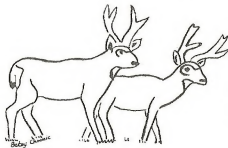
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS
Navajo Area Office
Window Rock, Arizona 86515

IN REPLY REFER TO:

34

Assistant Area
Director (Resources)

SEP 24 1975



BOULDER
AUDUBON
SOCIETY

PO Box 2081
Boulder, Colo. 80302

36

Memorandum

To: State Director, Bureau of Land Management, Salt Lake City, Utah
From: Acting Assistant Area Director
Subject: Review of Draft Environmental Impact Statement for the Kaiparowits Project

This office has reviewed the subject draft statement in the light of our jurisdiction and expertise. The proposed project impinges directly upon the Navajo Reservation only in the location of the Kaiparowits-Navajo, Kaiparowits-Phoenix and Kaiparowits-Moenocopi-Mohave transmission lines and the Copper Mine, Preston Mesa and Moenocopi microwave stations. The mitigating measures outlined for these areas are adequate for purposes of the draft environmental statement. Should these transmission line routes and microwave station locations be used, more detailed reclamation and archeological clearance requirements will be specified by this office as a prerequisite of the issuance of the necessary rights-of-way across Indian Land.

On page I-163 the present owner of the Coppermine Microwave Station location is listed as the Bureau of Land Management. According to the Navajo Tribal Land Administration, the Navajo Tribe is the owner.

Thank you for the opportunity to review this draft environmental statement.

September 26, 1975

Mr. Paul Howard
Utah Director, BLM
125 S. State Street
Salt Lake City, Utah 84111

Dear Mr. Howard,

The deleterious impact of the Kaiparowits Power Project on the ecology of southern Utah is too high a price for this power. This region is unique in the United States and the world, for desert and canyon ecology and scenery. The scenic quality as well as the land will be severely impaired by strip-mining, ash deposits, roads, transmission lines, and smoke. The nation has chosen to set aside National Parks, Monuments, and Recreation Areas to protect them for the enjoyment of the present and future generations; we should not damage these for the sake of short-term, panicky solutions of a current shortage.

The canyon and desert country of Utah and Arizona is very popular and very dear to many members of our community. It is a very frequently visited vacation spot, for backpackers, jeepers, and car-campers. While we appreciate the pressures induced by national energy needs, there must be a better way to solve them than by sacrificing this superb and popular vacation land.

Please enter this in the official hearing record on the draft environmental impact statement.

Sincerely,

Alan Gallagher
Conservation Chairman

AG:b

h5r-XI



In reply refer to: AJ

United States Department of the Interior

BONNEVILLE POWER ADMINISTRATION
P.O. BOX 3621, PORTLAND, OREGON 97208

September 24, 1975

Memorandum

To: Paul Howard, State Director, Bureau of Land Management, Utah

From: E. Willard, Assistant to the Administrator - Interagency Relations

Subject: Draft Environmental Statement on Proposed 3,000 Megawatt Kaiparowits Power Project in Southern Utah

We have reviewed subject draft (Chapter VIII) and offer the following comments:

Page No.	Comment
VIII-7	"dry" should be "Dry" - Second sentence from top of page.
VIII-15	"Qualify" should be "quantify" - Fourth sentence from top of page.
VIII-56	The third paragraph states that 490 tons of crude limestone would be converted into 280 tons of lime each day. It is our view that such production of lime will not be possible. The calculations should be redone. The expected handling losses of crude limestone, the provisions for contaminating compounds in the crude limestone, and the expected losses of product lime will make stoichiometric yield of unslaked lime (CaO) from pure limestone (CaCO ₃) unlikely. These considerations would lead one to "round off" the quantities to something like 500 tons of limestone per day rather than 490 tons. A simple calculation using the assumptions that crude limestone is CaCO ₃ and that

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Memo to Paul Howard, State Director, Bureau of Land Management, Utah, Subj: Draft Environmental Statement on Proposed 3,000 Megawatt Kaiparowits Power Project in Southern Utah

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Page No.	Comment
	unslaked lime is CaO shows that to produce 280 tons of unslaked lime that 500 tons of limestone is required: Tons limestone required = $100.9 \times 280 = 499.7$ tons 56.08 which rounds off to 500 tons satisfying simple stoichiometric relationships.
VIII-247	"Nipply" should be "Nipple" - Eighth line from top of page.
VIII-248	The first paragraph under Climate is written in a confusing and contradictory manner. The second sentence is incomplete and the conclusion that Fourmile Bench has much lower temperatures is not supported by the statement: "Whereas 0°F temperatures are rare at Nipple Bench, during the first year of operation at Fourmile, a December low of 15°F was recorded." Without access to the meteorological reports, one cannot determine just what revisions are in order to end the contradictions.
VIII-248	Next to the last paragraph, last sentence. Will the stagnation periods last for five to seven years and occur seven to eight times every five years?

We trust these observations will be of value.

IX-495



CLARK COUNTY REGIONAL PLANNING COUNCIL

118 South Fourth Street • Las Vegas, Nevada 89101 • (702) 386-4011

COUNCIL MEMBERS: County of Clark • Boulder City • Henderson
• Las Vegas • North Las Vegas • Clark County School District
• Las Vegas Valley Water District

September 26, 1975

Mr. Paul L. Howard, Director
Utah State Office of the
Bureau of Land Management
125 North State Street
Salt Lake City, Utah 84111

Subject: KAIPAROWITS ENVIRONMENTAL
IMPACT STATEMENT

Dear Mr. Howard:

The Clark County Regional Planning Council (CCRPC) has reviewed the Kaiparowits Environmental Impact Statement (Draft) under Office of Management and Budget A-95 procedures. The following comments are provided for inclusion in the Final Kaiparowits Environmental Impact Statement, as adopted at the CCRPC meeting of September 25, 1975.

The Clark County Regional Planning Council's policy is:

- I. No new power lines within Clark County region for the purpose of interstate transmission of power, except in the south point area (south of Davis Dam).
- II. All power transmission lines in the Clark County region require a conditional use permit issued by one or more Clark County Regional Planning Council member(s).

The alignment of the Kaiparowits-Moenkopi-Mohave and Mohave-Devers transmission lines (southern corridor through Arizona) is acceptable to the CCRPC if the following criteria are met:

1. Any new transmission lines will be immediately adjacent to existing corridors.
2. The existing corridor will not be widened by more than 200 ft. per transmission line.
3. A conditional use permit, or right-of-way permit, will be requested from the governmental entities affected by any transmission line alignment.

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Mr. Paul L. Howard
September 26, 1975
Page 2

This policy reflects the CCRPC position that our region should not suffer environmental degradation, airport closure and loss of airport site (i.e. land utilization options) by decisions made in Utah and California.

There is concern over the lack of information on the salts and trace elements which will be added to Las Vegas Valley drinking water (Colorado River) by operation of the power plant and coal mine, since we share the same watershed. The ITS acknowledges this lack of information, but that is no remedy for the problem. Prior to the issuance of construction permits, this information must be made available to determine the effects on this regions compliance with EPA water quality standards.

We respectfully appreciate the opportunity afforded us to respond to your Kaiparowits Environmental Impact Statement as it affects our member governments in the Clark County Regional Planning Council.

Sincerely,

CLARK COUNTY REGIONAL PLANNING COUNCIL


EDWARD F. DAVIS, AIF
Executive Director

EFD/ii

cc: Mr. John W. Arlidge, Assistant to the Vice-President
The Nevada Power Company
Las Vegas, Nevada

Mr. Frank M. Covington, Director
U.S. Environmental Protection Agency
Region IX
San Francisco, California 94111

Mr. John Boyles, Manager
Bureau of Land Management
Las Vegas, Nevada 89102

Mr. E. Rowland, Nevada State Director
Bureau of Land Management
Reno, Nevada 89502

Clark County Regional Planning Council Members
CCRPC Technical Committee Members

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IX-95

September 28, 1975

39

Paul L. Howard
State Director
O.L.M.
125 S. State St.
Salt Lake City, Utah 84111

RE: Kaiparowits D.E.I.S. for inclusion in the official transcript and record - representing Bridgerland Audubon Society of Utah.

Dear Sir,

I personally have read through the major sections of the Kaiparowits Draft E.I.S. It is a self-incriminating and damning document against the proposed power plant. The negative and suspected impacts are so numerous and of such magnitude that this proposal should never become reality. Bridgerland Audubon Society vehemently urges the rejection of the Kaiparowits project.

Question - Where will water for the power plant come from when Lake Powell has filled with sediments to the point that it is no longer able to supply the water?
What will be the additional impacts of the project to bring in this water?

Question - If the power companies making this proposal were to take even one tenth the amount of money that this proposed plant would cost, and instead direct it toward an advertising and education campaign stressing energy conservation, would there then be any need for the proposed power plant?

State Director, O.L.M.

September 28, 1975

page 2

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I represent a Utah organization that does not want to sacrifice the southern Utah excavations so that people in Los Angeles and Phoenix can have more electricity. If they want more electricity, let them mine southern Utah coal and burn it in Phoenix and Los Angeles.

Question - If coal were mined from the Kaiparowits Plateau and transported to Phoenix or Los Angeles to be burned in power plants there, would the environmental impacts be less than the present proposal's impacts? And would energy loss be greater over the proposed transmission lines, or by transporting the coal to be burned near where it would be used?

Since the proposed power plant would not be permitted in California due to more stringent air pollution laws than Utah, we feel Utah is being exploited unjustly.

There would of course be benefits to Utah in additional taxes for the state. But apparently Utah does not need the additional revenue, since we had a surplus budget this year. Still, most of Utah's legislators, politicians, and other worshippers of the Golden Calf favor the proposed power plant. But Moses taught us all about that, didn't he.

Sincerely,

Denis K. Davis
Conservation Chairman
Bridgerland Audubon Society
129 U.S.U. Trails Ct.
Logan, Utah 84321



THE CACTUS & SUCCULENT SOCIETY OF AMERICA

(INCORPORATED)

40

State Director
Utah State Office
Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

September 28, 1975

Dear Sir:

On behalf of the Cactus and Succulent Society of America, I wish to express concern regarding some aspects of the Galparowitz Environmental Impact Statement Draft.

The vegetation data, p. 174 in Vol. I, fails to mention what species of cactaceae and grassulaceae will be disturbed in Arizona because of the transmission lines. Also, we feel that there should be survey of vegetation that will be eliminated by construction of the powerplant and surrounding complexes.

The Draft should include detailed vegetation maps, not just dominant vegetation distributions, showing exactly where the endangered species are that lie in the way of the powerlines.

Methods of rescuing threatened and endangered species from destruction should be researched and included in the Draft, but preferably, alternate routes should be sought.

It is alarming to note that Toumeya papyracea (III-147), T. peeblesiana (III-148), and Pericactus parsonii (VIG.) are located along the transmission line route. The Smithsonian Report on Endangered and Threatened Species of the United States (House Document No. 91-51, Serial No. 91-A) lists these species as threatened and endangered. Survey work on the distributions of species listed in the Smithsonian Report will begin in the near future and implementation of the proposed powerline routes should be contingent upon completion of survey work of threatened and endangered species to be affected by the Galparowitz project. If such species cannot be protected, then the Cactus and Succulent Society could organize a rescue operation of cactaceae, transplanting them to other localities out of the way of the powerlines and access roads and/or in to cultivation.

With proposed powerlines extending from Fredonia, along the southern border of the Kaibab Indian Reservation, we would like to know if Pericactus stiversi is reported in the vegetation surveys. This species is endangered and is of very limited distribution, endemic only in the above mentioned areas. This species must be pin-pointed in relation to the proposed powerlines.

Sincerely yours,

Gary Lyons
Gary Lyons, Chairman, C.S.S.A. Conservation Committee.

IX-498



Northern Arizona University · FLAGSTAFF, ARIZONA 86001

BOX 5640

DEPARTMENT OF BIOLOGICAL SCIENCES

PHONE (602) 523-3535

September 29, 1975

State Director
Utah State Office
Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

Re: Draft EIS for the Kaiparowits Project

1. At least four reports of our studies in the Kaiparowits Basin for the Kaiparowits Project were used in the preparation of the draft EIS, but none were cited in the References Material. In at least two instances, tables used in the draft EIS appeared originally in our reports. References to these reports that should have been included are the following:
 - a) Northern Arizona University. 1972. Kaiparowits Environment Impact Study. 1971-72. Third Quarterly Report. Northern Arizona University. Flagstaff, Arizona.
 - b) Navajo Generating Station Ecological Baseline Studies. Annual Report. I June 1971 - 31 May 1972. Northern Arizona University. Flagstaff, Arizona. 282p. NTIS Accession No. PB 242843.
 - c) Environmental Impact Studies of the Navajo and Kaiparowits Power Plants. Second Annual Report. 1 June 1972 - 31 May 1973. Northern Arizona University. Flagstaff, Arizona. 260p. NTIS Accession No. 242846.
 - d) Supplemental Environmental Studies of the Kaiparowits Generating Station. May 1973. Northern Arizona University. Flagstaff, Arizona. 28p. NTIS Accession No. 242844.
2. Some ecological impacts that undoubtedly will occur are discussed in the draft EIS. Others are not because the necessary information is not available. If the Project attains reality, research should continue or be initiated to assess both expected and unknown ecological impacts. Particularly important are the direct and indirect effects of effluent (acid gases and trace elements especially) released from the plant.
3. The time available for comment does not permit a complete reading of this large document, but I feel compelled to mention one erroneous statement. On page III-67, it states, "There is no known information regarding the soil micro-organisms presently in the soil and therefore subsequent impacts would be strictly theoretical and possible invalid."

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State Director
September 29, 1975 - Page 2

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The latter three reports mentioned above provide data on soil micro-organisms of the area and discuss their significance. Further information on the functional interrelationships between the micro-organisms and their environment, as well as their response to simulated power plant effluent is included in the following reference, and will also be discussed in our next annual report:

- e) Environmental Impact Studies of the Navajo and Kaiparowits Power Plants. Third Annual Report. 1 June 1973 - 31 May 1974. Volume 1. Northern Arizona University. Flagstaff, Arizona. 390p. NTIS Accession No. 242845.

Impacts of the Kaiparowits Project on soil micro-organisms can be discussed more adequately in the light of these results. However, a satisfactory picture depends on the completion of further work.

Sincerely yours,

William S. Gaud

William S. Gaud, Director
Environmental Impact Studies

IX-499

Mr. John P. Dickinson
Dept. of Economic Security
1717 West Jefferson Street
Phoenix, Arizona 85007

FROM: Constance LaMonica

This project is referred to you for review and comment. Please evaluate as to:

- (1) the program's effect upon the plans and programs of your agency
- (2) the importance of its contribution to State and/or statewide goals and objectives
- (3) its accord with any applicable law, order or regulation with which you are familiar
- (4) additional considerations

Please return this form to the clearinghouse no later than 15 working days from the date noted above. Please contact the clearinghouse if you need further information or additional time for review.

- ☒ No comment on this project
☐ Proposal is supported as written
☐ Comments as indicated below

Comments: (Use additional sheets if necessary)

IX-501

Reviewer's Signature

Title: State Planner

State Application Identifier (SAI)

August 8, 1975

State AZ

Number 75-80-0035

Economic Sec.
Civil Rights
Indian Affairs
Game & Fish
Mineral Res.
Bureau of Mines
Arid Lands Studies
S.W. Mineral Expt.
Archaeological Research
Prescott Historical Society
Museum of Northern Arizona
Oil & Gas Conservation Comm.
Region III

Highway
Aq. & Hort.
Power
Health
Land
Water
Parks
AORCC
CEPAD

TO:

Mr. Ford Smith, Exec. Dir.
Civil Rights Div, Dept of Law
1645 W. Jefferson, Room 140
Phoenix, Arizona 85007

FROM: Constance LaMonica

This project is referred to you for review and comment. Please evaluate as to:

- (1) the program's effect upon the plans and programs of your agency
- (2) the importance of its contribution to State and/or statewide goals and objectives
- (3) its accord with any applicable law, order or regulation with which you are familiar
- (4) additional considerations

Please return this form to the clearinghouse no later than 15 working days from the date noted above. Please contact the clearinghouse if you need further information or additional time for review.

- ☐ No comment on this project
☒ Proposal is supported as written
☐ Comments as indicated below

Comments: (Use additional sheets if necessary)

Reviewer's Signature

Title: Executive Director

State Application Identifier (SAI)

August 8, 1975

State AZ

Number 75-80-0035

Economic Sec.
Civil Rights
Indian Affairs
Game & Fish
Mineral Res.
Bureau of Mines
Arid Lands Studies
S.W. Mineral Expt.
Archaeological Research
Prescott Historical Society
Museum of Northern Arizona
Oil & Gas Conservation Comm.
Region III

Highway
Aq. & Hort.
Power
Health
Land
Water
Parks
AORCC
CEPAD

Date: 8-19-75

Telephone

Mr. Clinton M. Patton
Executive Secretary
Indian Affairs Commission
1545 West Jefferson St.
Phoenix, AZ 85007

From: Constance LaMonica

This project is referred to you for review and comment. Please evaluate as to:

- (1) the program's effect upon the plans and programs of your agency
- (2) the importance of its contribution to State and/or areawide goals and objectives
- (3) its accord with any applicable law, order or regulation with which you are familiar
- (4) additional considerations

Please return this form to the clearinghouse no later than 15 working days from the date noted above. Please contact the clearinghouse if you need further information or additional time for review.

- ☒ No comment on this project
☐ Proposal is supported as written
☐ Comments as indicated below

Comments: (Use additional sheets if necessary)

1X-502

Reviewer's Signature: Clinton M. Patton

Title: _____

Date: 8-22-75

Telephone: _____

42

State Application Identifier (SAD)

August 8, 1975

State AZ

Number

75-80-0035

Economic Sec.
Civil Rights
Indian Affairs
Game & Fish
Mineral Res.
Bureau of Mines
Arid Lands Studies
S.W. Mineral Expl.
Archaeological Research
Prescott Historical Society
Museum of Northern Arizona
Oil & Gas Conservation Comm.
Highway
Aq. & Hort.
Power
Health
Land
Water
Parks
AORCC
OSPAD
Region III

Mr. L. D. McCorkindale
Agriculture & Horticulture Dept.
414 Capitol Annex West
Phoenix, Arizona 85007

From: Constance LaMonica

This project is referred to you for review and comment. Please evaluate as to:

- (1) the program's effect upon the plans and programs of your agency
- (2) the importance of its contribution to State and/or areawide goals and objectives
- (3) its accord with any applicable law, order or regulation with which you are familiar
- (4) additional considerations

Please return this form to the clearinghouse no later than 15 working days from the date noted above. Please contact the clearinghouse if you need further information or additional time for review.

- ☐ No comment on this project
☒ Proposal is supported as written
☐ Comments as indicated below

Comments: (Use additional sheets if necessary)

Reviewer's Signature: L. D. McCorkindale

Title: Director

Date: 8-15-75

Telephone: 271-4373

42

State Application Identifier (SAD)

August 8, 1975

State AZ

Number

75-80-0035

Economic Sec.
Civil Rights
Indian Affairs
Game & Fish
Mineral Res.
Bureau of Mines
Arid Lands Studies
S.W. Mineral Expl.
Archaeological Research
Prescott Historical Society
Museum of Northern Arizona
Oil & Gas Conservation Comm.
Highway
Aq. & Hort.
Power
Health
Land
Water
Parks
AORCC
OSPAD
Region III

TO:

Mr. Les Ormsby, Admin.
Arizona Power Authority
1810 West Adams Street
Phoenix, Arizona 85005

From: Constance LaMonica

This project is referred to you for review and comment. Please evaluate as to:

- (1) the program's effect upon the plans and programs of your agency
(2) the importance of its contribution to State and/or areawide goals and objectives
(3) its accord with any applicable law, order or regulation with which you are familiar
(4) additional considerations

Please return this form to the clearinghouse no later than 15 working days from the date noted above. Please contact the clearinghouse if you need further information or additional time for review.

- ☒ No comment on this project
☐ Proposal is supported as written
☐ Comments as indicated below

Comments: (Use additional sheets if necessary)

IX-503

Reviewer's Signature: *L. Ormsby*Date: *8/13/75*

Title:

Telephone:

42

State Application Number (SAD)

August 8, 1975

State AZ

Number 75-80-0035

Economic Sec. Highway
Civil Rights Ag. & Hort.
Indian Affairs Power
Game & Fish Health
Mineral Res. Land
Bureau of Mines Water
Arid Lands Studies Parks
S.W. Mineral Expl. AORCC
Archaeological Research OEPAD
Prescott Historical Society Region III
Museum of Northern Arizona
Oil & Gas Conservation Comm.

TO:

Mr. Roland H. Sharer
State Liaison Officer, AORCC
4433 N. 19th Ave., Suite 203
Phoenix, Arizona 85015

From: Constance LaMonica

This project is referred to you for review and comment. Please evaluate as to:

- (1) the program's effect upon the plans and programs of your agency
(2) the importance of its contribution to State and/or areawide goals and objectives
(3) its accord with any applicable law, order or regulation with which you are familiar
(4) additional considerations

Please return this form to the clearinghouse no later than 15 working days from the date noted above. Please contact the clearinghouse if you need further information or additional time for review.

- ☒ No comment on this project
☐ Proposal is supported as written
☐ Comments as indicated below

Comments: (Use additional sheets if necessary)

42

State Application Number (SAD)

August 8, 1975

State AZ

Number 75-80-0035

Economic Sec. Highway
Civil Rights Ag. & Hort.
Indian Affairs Power
Game & Fish Health
Mineral Res. Land
Bureau of Mines Water
Arid Lands Studies Parks
S.W. Mineral Expl. AORCC
Archaeological Research OEPAD
Prescott Historical Society
Museum of Northern Arizona Region III
Oil & Gas Conservation Comm.

Reviewer's Signature: *R. H. Sharer*Date: *Aug 19 1975*Title: *State Liaison Officer*Telephone: *271-5213*



RAUL H. CASTRO
Governor

WILLIAM A. GRADWAY
Director

ARIZONA DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

200 South Seventeenth Avenue Phoenix, Arizona 85007

August 14, 1975

42

WILLIAM N. PRICE
State Engineer

Mr. Paul Howard
State Director
Bureau of Land Management
Department of the Interior
125 South State Street
Salt Lake City, Utah 84111

Re: Draft Environmental Impact Statement
Kaiparowits Power Project
State Identifier: 75-80-0035

Dear Mr. Howard:

Thank you for submitting the Draft Environmental Impact Statement for the Kaiparowits Power Project for our review and comment.

We do desire to make comment but will be unable to do so within the 15-day deadline. We wish to request a two-week extension of time for such review and comment.

Yours very truly,

WM. N. PRICE
State Engineer

MASON J. TOLES, Manager
Environmental Planning Services

HJT/cm

cc: Mrs. Constance LaMonica
State Clearinghouse
Office of Economic Planning
and Development
1624 West Adams
Phoenix, AZ 85007



P.O. Box 9665
Phoenix, Az. 85070
Sept 28, 1975

Paul Howard, State Director
Bureau of Land Management
125 South State Street
Salt Lake City
Utah 84111

Dear Sir:

We have reviewed the environmental impact statement on the proposed Kierulff-Petersen Project and the contents have been brought to the attention of the membership of our Society.

While we might have liked to have seen more detail relative to archaeological surveys we believe that ample protection has been made to protect significant archaeological sites which are unknown or which may come to light as the project progresses.

Therefore we have no objections nor do we have any constructive criticism to offer.

Sincerely

Frederick H. Nelson
Chairman, Environmental Impact Committee
Oregon Archaeological Society
Phoenix Chapter
Phoenix Arizona



Plateau Sciences Society

Navajo Tribal Museum
Window Rock, Arizona 86501

INTRODUCTION

The Plateau Sciences Society is affiliated with the Navajo Tribal Museum, Window Rock, Arizona. The overall purpose of the Society is to encourage better understanding and appreciation of the Colorado Plateau region and its diverse peoples and cultures through the study of the natural and social sciences relating to the region.

The present membership of the Society consists of over 250 people, Navajo and non-Navajo, professional and non-professional, the majority residing within the Colorado Plateau region, but including members from throughout the Southwest and scattered throughout the rest of the country.

Members of the Society have been interested in and concerned about the developments and proposed projects in the Kaiparowits area since before the construction of the dam and the creation of Lake Powell. Numerous field trips have been taken to various sites within the area. Guest speakers have been hosted, films and slide programs have been viewed and a continuous study of relevant literature pertaining to the region are some of the ways by which members have remained in touch with the activities going on or being proposed for the region.

The composition of the membership of the Society and the development of its activities over the past years has led it to be concerned with a wide range of interests, covering such areas as the rights of the Indian peoples, including their right to determine the proper procedures for use of the natural resources of their lands, a concern for wildlife, the need for creation of a proper balance between development of resources to meet real needs and the protection of the environment, and the great need for protection of the decreasing number of natural areas of the country that have not yet been exploited in order to preserve a legacy for future generations.

All of these concerns are expressed in the proposals relating to the Kaiparowits power plant, and this, on behalf of the Society, we wish to submit the brief statement enclosed for inclusion in the hearing record regarding the Environmental Impact Statement regarding the proposed Kaiparowits power plant.

Sincerely,

Patrick E. Graham
Executive Board

STATEMENT REGARDING THE PROPOSED KAIPAROWITS POWER PLANT AND SUPPORTING FACILITIES

Compiling a detailed and comprehensive statement that would effectively probe each of the questionable aspects of the Kaiparowits Power Plant complex seems as redundant as is much of the Environmental Impact Statement which is under consideration. Instead, we submit for the hearing record only a few summary questions which have not yet been suitably answered by anyone.

All of these questions are covered by one referring to the major omission thus far-- why has not the United States Department of the Interior ever complied with the National Environmental Policy Act, as requested by environmental and Indian groups, and prepared an environmental impact statement on the entire Southwest energy complex?

Instead, we get thick and redundant EIS volumes pretending that Kaiparowits can be environmentally isolated from Glen Canyon and vice versa. Does this continually preparation of EIS volumes -- on Kaiparowits, Four Corners, Four Corners additions, San Juan, Coronado, Cholla additions, Page, El Paso, WESCO, etc., etc., etc.-- keep bureaucrats busy or is the piecemeal procedure preferable because it obscures the total impact of these massive developments just as their impact is obscuring our skys and natural landmarks?

As in other EIS volumes applying to projects in the Southwest, many of the appropriate questions are asked, but few suitable answers are provided. Is there really enough water available to meet the needs of the power plant? Serious questions have been raised-- without answers.

Will a mere 12 miles overcome the questions that were raised relative to this project in 1973?

A great deal of stress has been given to the many new jobs that will be available. How many of these will be available to people already living in the area? Won't many jobs require skilled technicians-- many of whom are not presently available anywhere? The "boomtown" situation that has been created by projects such as this in Alaska and in Montana have caused countless problems, with the people native to the area suffering most of the consequences. No realistic attempt has been made to explore or prepare for these in the Kaiparowits area.

No answers have been given to the opinions raised by experts regarding the impact of the power plant on Lake Powell and the Glen Canyon Recreational Area.

Despite the fact that this project has been in the planning stage for 15 years, no realistic alternatives have been suggested or studied. It may be that in light of the "energy crisis" the coal is needed. This need at present is not based on an "survival" condition by a long sight. Not when utility companies are worried that conservation of energy will cut into their profits and mean higher prices. Not when mining companies are asking for federal subsidies. Not when the majority of low sulphur coal in the east is not being mined.

IX-905

Any approval given to the Kaiparowits power plant at this time would be a serious blunder and would be without justification.

Acceptance of the EIS under discussion would make a joke of the entire concept underlying the entire rationale for the preparation of an EIS.

We submit that, despite the 15 years involved, no serious, comprehensive study of the proposed project and possible alternatives has not yet taken place.



ARIZONA WILDLIFE FEDERATION

P.O. Box 1769 • Phoenix, Arizona 85001 • Phone (602) 252-7371



September 29, 1975

DOUGLASS C. BAKER
President

Mr. Paul L. Howard, State Director
BUREAU OF LAND MANAGEMENT
Federal Building
125 South State Street - P.O. Box 11505
Salt Lake City, Utah 84111

Dear Mr. Howard:

Thank you for including the Arizona Wildlife Federation on the mailing list for the Kaiparowits Draft Environmental Impact Statement. The BLM is to be commended for compiling the five volumes of materials presented as the DEIS. Volunteer conservation organizations such as the Arizona Wildlife Federation must rely to a large degree on our public agencies to protect our natural resources from unnecessary exploitation.

The Arizona Wildlife Federation is concerned with all public and private projects which could have harmful effects on our total environment, however, we are primarily concerned with the wildlife resources and the habitat which sustain them. We will therefore concentrate our comments on one specific area of environmental concern, the destruction of wildlife habitat.

The Draft EIS states that 1,457 miles of transmission lines and 1,900 miles of access roads will be required. We believe the access roads to be the prime impact on our wildlife resources, both from a habitat destruction and additional access to remote areas.

We, therefore, challenge the participants of the Kaiparowits project through the BLM and NEPA process to produce documented evidence that, "if a third line is required, it will be separated by a distance equal to, or greater than, the longest span length per the line sections involved (about 2,000 feet), IF POSSIBLE". (Emphasis added - page 1-159) We suggest that this evidence be

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Mr. Paul L. Howard, BLM

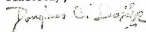
-2-

September 29, 1975

in the form of disrupted service data for similar geographic regions which the proposed transmission lines would cross. If such evidence is not available the terminology "paralleling existing corridors" should be abandoned and such lines be assessed as a totally new corridor.

Again, our thanks for having the opportunity to comment.

Sincerely,


Douglas C. Baker,
President
ARIZONA WILDLIFE FEDERATION

DCB/ils

cc: J. Russell Penny, State Director, California BLM
E. I. Rowland, State Director, Nevada BLM
Robert Buffington, State Director, Arizona BLM

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805-XI



In reply refer to: AJ

United States Department of the Interior

BONNEVILLE POWER ADMINISTRATION
P.O. BOX 3027, PORTLAND, OREGON 97208

September 30, 1975

Memorandum

To: Paul Howard, State Director, Bureau of Land Management, Utah

From: E. Willard, Assistant to the Administrator - Interagency Relations

Subject: Draft Environmental Statement on Proposed 3,000 Megawatt Kaiparowits Power Project in Southern Utah

On September 24, 1975, we sent our comments to you regarding subject draft. However, we do have the following additional comments for your consideration.

General Comments: The Table of Contents would be more easily understood if outlined letters and numbers were used on the left side.

Chapters III through VII could be better organized so the reviewers could more readily find items of specific interest.

Chapter II adequately describes the existing environment. A removable map of the project area would make it easier to follow the narrative discussions. The description of wildlife seems to go into unnecessary detail, particularly in the area of transmission lines. Some of the creatures discussed could not conceivably be impacted by transmission lines. Possibly the environmental impact could exclude such species and still be responsive to legal or administrative criteria.

The glossary of terms uncommon to the layman assists materially in understanding the report.

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Memo to Paul Howard, State Director, Bureau of Land Management, Utah

Specific Comments: Chapter III. Pages 147, 148, and 149. The discussion helps the reader to understand the rare and endangered plant problem, however, maps showing the likely locations would be helpful to the reader.

Page 290. The number of statistics on the page could be reduced by eliminating the plus or minus percentages.

Chapter IV-1. Center of page. "Any loss of human life would unquestionably be an irreversible, irretrievable commitment." Since loss of human life is always irreversible and irretrievable, why must this be stated?

The titles of the tables appear to be incomplete.

Figures 5 and 10 (pg. II-27 and II-34), pertaining to air quality sampling, do not indicate where the samples were taken. There may be more such omissions.

We appreciate the opportunity to comment further on this draft.

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IX-505





402 East State Hi-Way, Copperton
Bingham Canyon, Utah 84006
Sept. 29, 1975

Bureau of Land Management
Department of Interior
Mr. Paul L. Howard, Director

Re: THE KAIPAROWITS PROJECT

Dear Mr. Howard:

At a special meeting of the Board of Directors of the Mineralogical Society of Utah under date Sept. 29, 1975 the following policy was projected and endorsed by them regarding the Kaiparowits Project.

1. The almost complete endorsement of objection's registered by the Sierra Club and other organizations concerned with the welfare of our State and our people.
2. We need the water and our National Parks as much as any State in the Union needs theirs and are willing to fight for them.
3. We do not stand for mass environmental destruction in any form for any group action benefit.

We firmly believe that the coal should be burned in the States that will get the benefit of the power. The coal could be transported by slurry pipe to those areas using water that has already been allocated to them from the Colorado River Projects. They in turn could recover that water, treat it and use it for those purposes for which it was originally claimed. Today, multiple use of every natural asset is a must. Other states have been successful in their demands that the coal for out of state energy be transported by pipe lines or unit trains.



The entire set of your volumes on environmental impact have been reviewed and we can in no way see nothing but damage to our states resources by the Kaiparowits Power Project.

Thanking you and our government for the chance for an audience in our chance to speak for our own existence.

Sincerely

Officers and Board of Directors of M.S.U.



5

NATIONAL PARK SERVICE
WASHINGTON, D.C. 20240

SEP 30 1975

Memorandum

TO: State Director, Bureau of Land Management, Salt Lake City

Deah

Through: Assistant Secretary for Fish and Wildlife and Parks

From: Director, National Park Service

Subject: Draft Environmental Statement, Kaiparowits Power Project

Utah (DES 75-43)

As requested in your memorandum of July 29, we have reviewed the subject statement and submit the following comments.

Cultural Resources

The statement should document consultation with the four State Historic Preservation Offices (SHPOs) in the State of New York. If there are sites in the various project areas which may be on or eligible for inclusion on the National Register of Historic Places, a letter should be sent to the National Register, dated 9/9/1962 to 1/1/1963, which appears to be eligible for National Historic Landmark status. The National Register of Historic Places should be referred to the Assistant Director, Office of Determination of Eligibility for inclusion on the National Register as to whether or not the site is eligible for inclusion on the National Register as a result of the above consultation. The Bureau of Land Management and the State Historic Preservation Office should apply the "Criteria for Effectiveness of the National Register of Historic Places" and the "Criteria for Effectiveness for the Protection of Historic and Cultural Properties."

Surveyors appear to have been completed on a small portion (10 percent) of the Impact area, p. 11-246). In order to identify potentially significant cultural resources, it will be necessary to conduct a complete archaeological field reconnaissance survey of all project lands. Such a survey would include lands to be directly affected by the project, such as the generating plant, the minisite, the new turbine, the new highway, the line piers, all access roads, the water pipeline and pump station, transmission



2

lines and other ground disturbing features. These investigations should be directed toward evaluation of all archaeological remains for possible inclusion on the National Register and should define any adverse impact to them resulting from project activities. This information is a necessary prerequisite to formulation of measures to lessen such adverse effects.

The statement should describe and reference the archeologists' findings and recommendations pertaining to the need for further research.

The final environmental statement should present procedures to be implemented in the event previously unknown cultural resources are encountered during project construction. It should reflect compliance with Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800).

Air quality and aesthetics

The effects of air pollution from the proposed plant should be assessed in terms of the impact on the vegetation and wildlife resources of the areas of Influence, i.e. Canyon National Recreation Area and the adjacent Grand Canyon National Park. Canyon National Park is a large undeveloped area with a wide variety of plant and animal life. Canyon National Park is within 100 air miles of the plant and will undergo significant air quality deterioration. Canyonlands National Park, located just National Park, Cedar Breaks National Monument, Zion National Park, and Panguitch National Monument are also within the area of Influence. Grand Canyon National Monument is within 100 air miles of the plant and Nevada National Monument are within 100 air miles of the plant and will undergo air quality impairment under extremely adverse meteorological conditions. Some of these parks were established wholly or partially to preserve the most significant geologic resources within the area of Influence. The most significant geologic resources within the area have been recommended for preservation as wilderness under the Wilderness Act of 1964, or are under study for such designation. Deterioration of air quality, however minor, lessens the significance of these resources.

It is the policy of the U.S. Department of the Interior to protect the legislative purposes of these parks and to the purpose for which wilderness areas within them are being established.

Progressive deterioration of air quality in the four corners region is a cumulative impact of increasing development. Individual projects may make relatively minor contributions to the total pollution level, but collectively their effects are severe. The impacts of the proposed plant appear to have been analyzed without regard to the air quality deterioration that has already taken place, is now taking place, and will continue to take place as a cumulative impact of energy development in the region. With respect to each of the affected parties, the environmental statement would be substantially improved by an assessment of (1) the contribution of energy development projects to air pollution levels

4

According to guidelines recently issued by the Environmental Protection Agency, under authority of the Clean Air Act, for the prevention of air pollution, the National Park System are among the places where there is virtually any decrease in the quality of the air should be considered significant. Where these guidelines it appears that a plant, such as the one proposed, should be placed in an area of the country in which the air quality is usually accepting moderate well planned growth would not be considered a significant deterioration. It is indicating the necessary detailed studies to support a recommendation that the appropriate air quality deterioration designation for many areas of the National Park System is Class I.

He did not agree with the "low" ranking given for the degree of aesthetic impact from Rainbow Point Overlook, Bryce Canyon National Park (Figure 4, p. III-205). In fact, the Four-Mile Bench is visible from all major overlooks. However, only Rainbow Point is mentioned in the statement. The overlook will be affected by the visual impact of the plant complex and by decreased visibility due to stack extractions.

Additional information concerning wildlife resources is required to properly assess project impacts upon them. Examples of inadequacies and inaccuracies in the wildlife area that we observe are:

- 4

7. Raptor nesting occurs throughout the Grand Canyon.
8. Wild turkey occur in the canyons between the Shivwits Plateau and the Colorado River, as well as on the Hualapai Indian Reservation and the Kaibab National Forest.

The mercury discharge section primarily addresses the sport fishery of Lake Powell. Consideration should be given to the possible effects of this discharge on Bryce Canyon National Park and local communities in Bryce Valley.

There is the potential for a multiplicity of transmission lines, even beyond those proposed for Kaiparowits, paralleling the existing line

through the Arizona Strip in front of Pipe Spring National Monument. No alternate route has been developed, or studied, which would place the proposed corridor further south in the strip and possibly out of sight of Pipe Spring.

Ganiam Peak is identified as a potentially viable alternate for a limestone source. There is no evidence that impacts associated with the Ganiam Peak site have been thoroughly examined with respect to those of adverse impacts on Bryce Canyon National Park. Increased air, noise, and water pollution will affect the northern part of the park, which is traversed by Utah Route 12. This highway will be used by limestone hauling trucks (estimated 30 trips per day) and oil tankers, as well as heavy equipment. Increased traffic will have adverse impacts on the inconvenience park visitors, impair aesthetics and the visitor's experience, and create public pressure to construct passing lanes. Upgrading of the road system, if implemented, would have direct adverse impacts on park resources. Use of the Ganiam Peak site would eliminate impacts on the park that are associated with haulage on route 12.

Comments on the Proposal

There remains an apparent gap in planning in the initial phase of the proposed project. Illustration No. 1 (p. 1-5) and Illustration No. 1-270) indicates that the first route of access to the plant and admetics would be from the north. This would apparently continue to be the principal route of access for equipment and material during the entire construction phase and, although it is not said specifically, it is implied that the route would continue to be the principal route of access to the facility near the plant site. There is no apparent separating of the Clark Bench town or access from the south into the construction site. As indicated on page 1-274, once the decision to construct the southern access route is reached, it will require a year to design it and 1 1/2 years to construct it. It appears that the project would be completed during the interim, pending final Departmental clearance for the project and issuance of permits. It is doubtful that construction of that road could begin before clearance for plant construction was obtained. It would be expected then that the project would be 1 1/2 years into construction before the southern access route was finished.

During that period the table on page 1-272 indicates that between 761 and 1,667 workers would be employed at the plant site the entire, and the limestone quarry. This is as much as half the total projected employment for the project. It is not clear, however, what part of the project personnel, it appears that patterns of residence, services, commercial centers, and transportation will be established by the initial work

force before the access from the south is available, thus compromising the economic efficiency, if not the viability of the East Clark Bench limestone plant. There is no evidence in the project plan that any other housing site, beyond construction of the limestone plant, is being planned for worker housing in the initial 1 1/2 years.

The viability of the contingency housing plans discussed on pages 1-306 and 1-307 is dependent on the availability of peak access from East Clark Bench to the plant site and quarry sites. There is no apparent recognition of this in the proposal.

General Comments

There is little mention that Kaiparowits coal is a national resource, deserving efficient and extended use. The alternative of reducing the scale of the project to extend the lifetime of the coal beyond 35 years should be considered.

Plans for reclamation of the plant site and support facilities, including removal of structures, conveyors, transmission lines, lift stations, roads, etc., to be implemented when the plant has served its usefulness, should be described.

Illustration No. 1 (p. 1-5) - The impact area does not include Bryce Canyon National Park. The proposed generator site, or portions of such, would be visible to Bryce Canyon National Park site, therefore, would pose a visual intrusion or impact.

Illustration No. 3 (p. 1-9) - Zion National Park is included on the map but Bryce Canyon National Park, within visual distance of the generating plant, is not. We believe Illustrations 1 and 3 should be corrected.

There is ambiguity relating to water use. In Chapter I, Figure 1, the value is 50,400 acre-feet per year, as noted as mentioned on page 13 of Chapter I, and on page 9 of Chapter VIII.

In Chapter III, page 2, calculated SO₂ emissions are deemed within standards for Class II air. It is not clear, however, what part of the SO₂ emissions will be used in design efficiency. What is the record with operating plants?

The possible adverse effects of nitrogen oxides on vegetation should be assessed.

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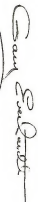
Summary

Development of the Kaiparowits plant as presently planned will cause serious air quality degradation in Glen Canyon National Recreation Area and adjacent areas. Such deterioration is in marked contrast to the purpose for which these areas were established. Comprehensive consideration should be given to modifying the project so that units of the National Park System and other regional resources possessing outstanding natural and scenic value will not be adversely affected.

Forest fuel power plants have already had an adverse impact on air quality in the Four Corners region. The cumulative effects of air pollution from operating present plants, the proposed project, and other proposed energy and mineral development projects should be comprehensively considered in the planning process of any future development in the region. The threat to the integrity of environmentally significant resources, including at least 20 units of the National Park System,

is so great that the project be modified, relocated, or reduced in size. The proposed energy project, as presently planned, will remain unfinished. It should be made clear that the project will not be considered as presently envisioned if parks in the affected area are designated Class I under the new EPA guidelines for prevention of significant air quality deterioration.

cc: Director, Bureau of Land Management




United States Department of the Interior

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NATIONAL PARK SERVICE
WASHINGTON, D.C. 20208

IN REPLY REFER TO:

L/ADP-80

OCT - 1975

Memorandum

To: State Director, Bureau of Land Management, Salt Lake City,

Utah

Through: Assistant Secretary for Fish and Wildlife and Parks

From: Associate Director, Park System Management

Subject: Clarification of Comments on Kaiparowits Power Plant, Utah
(RBS 75-43)

On page 3 of our September 30, 1975, comments on the subject draft statement we inadvertently misstated our concern related to power plant location. Our comment in the second full paragraph of this page should be amended to show that under the new EPA guidelines it appears that the proposed plant would be located in a Class I area. In an area of the country in which deterioration of air quality results in an accompanying moderate will planned growth would not be considered significant.

Please amend our previous comments accordingly.

cc: Director, Bureau of Land Management






DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS
SACRAMENTO AND CONTROL WALL
SACRAMENTO, CALIFORNIA 95841

STCDD-N

PERMIT TO
ATTENTION OF

29 September 1975

52

CONSENTS
DRAFT ENGINEERING CONTRACT STATEMENT
ON THE PROPOSED KALAPOWITS POWER PROJECT

52

State Director
US Department of Interior
Bureau of Land Management
P. O. Box No. 1505
Salt Lake City, Utah 84111

Dear Sir:

This is in reply to your letter of 29 July 1975 addressed to the Chief of Engineers requesting review and comment on the draft environmental impact statement (EIS) on the proposed Kalapowits Power Plant located on the Klamath River in the Sacramento-San Joaquin River Delta, Sacramento District for review and direct reply since this project falls within the jurisdiction of this District.

Our enclosed comments on the EIS are primarily limited to the effect the project may have on navigation and the Federal Water Pollution Control Act of 1972 (FWPCA).

We appreciate the opportunity to comment on this EIS.

Sincerely yours,

I Incl
As stated

George C. Woodruff
GEORGE C. WOODRUFF
Chief, Engineering Division

1. It is evident from the EIS that measures are planned to regain increased navigation and flood control on the Klamath River. The measures include works have been included to bypass natural drainage and to collect runoff from solid waste disposal areas and direct such runoff to an evaporation pond. These measures are designed for a 100-year flood event which appears to be a reasonable degree of protection.
2. The EIS mentions that the new town to be located on East Clark bench is traversed by intermittent washes. Accordingly, it is recommended that the flood potential be recognized by restricting development in flood hazard areas and providing structural protection. Also, it is recommended that road crossings of streams be designed to avoid flow restriction and erosion problems.
3. The ash disposal area and adjacent drainage system, the mine tailings pond, and the runoff evaporation pond, as indicated on page W-26, are not shown on the map of the project. These facilities should be monitored and maintained following the project completion to ensure that contaminants from the facilities do not reach Lake Powell.
4. Construction of the water intake structure on Lake Powell will require a Corps navigation permit. However, based on the preliminary design of the structure, it does not appear that it would present any obstruction to navigation use on the lake.
5. Outlined on page i-33 are the Corps of Engineers responsibilities. In addition to the Section 10 navigation permits mentioned, the Corps has jurisdiction regarding discharge of dredged or fill material into streams as required by Section 404 of the 1972 FWPCA. The Corps' regulations under Section 404 are fully described in the Federal Register, Volume 40 - 37450, dated May 1975. The permit procedures under Section 404 were expanded on 25 July 1975 to cover wetlands and other ways of the United States. Effective 1 July 1976 the regulation will also apply to discharges of dredged or fill material into primary tributaries of navigable waters, and all bodies of standing water created by the impoundment of flood waters. The Corps' jurisdiction extends into secondary tributaries of navigable waters where the flow exceeds 5 cubic feet per second. Placement of fill material associated with construction of any structure in such waters is covered by the program.

El Paso NATURAL GAS
COMPANY

P.O. BOX 1480
EL PASO, TEXAS 79919
PHONE 513-432-3800

53

September 30, 1975

Mr. Paul Howard
State Director
Bureau of Land Management
P. O. Box 11605
Salt Lake City, Utah 84111

Re: Comments on the Kaiparowits Draft Environmental Impact Statement

Dear Mr. Howard:

The following are our comments on the Kaiparowits Draft Environmental Impact Statement.

The table on page I-351 (Figure 54) needs the following corrections:

(a) The "Participant Column" should use "El Paso Company" instead of "El Paso Gas."

(b) The size and proposed date for commercial operation should be as follows:

Burnham I	286 Million SCFD	1978
	325 Million SCFD	1979
Burnham II	286 Million SCFD	1980
	460 Million SCFD	1981

Should you have questions or require additional information, please call me.

Sincerely,

Charles R. Bowman

Charles R. Bowman
Manager
Environmental Affairs

CRB:cwb



United States Department of the Interior
MINING ENFORCEMENT AND SAFETY ADMINISTRATION
4015 WILSON BOULEVARD
ARLINGTON, VIRGINIA 22208

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October 1, 1975

Mr. Paul L. Howard
State Director
Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

Kaiparowits will become part of MESA's routine mine inspection responsibility.

We have no special comment arising from jurisdiction.

Sincerely yours,

C. O. Lockwood
C. O. Lockwood



IX-516

Mr. Paul L. Howard
Utah State Director
Bureau of Land Management
Page three
September 30, 1975

In reviewing the environmental impacts and social concerns, there can be many conflicts from projects limiting the negative impacts. Among the positive impacts would be:

- to provide needed jobs to help bolster the economy;
- to add to the net national product, as well as the gross national product, and thus help pay the national debt;
- reduced dependence on imported oil, which
- can help keep electrical costs more in line,
- will provide a reliable, domestic resource, and
- will reduce pollutants due to burning oil.

In your consideration of the Environmental Impact Report, we would ask that you keep in mind:

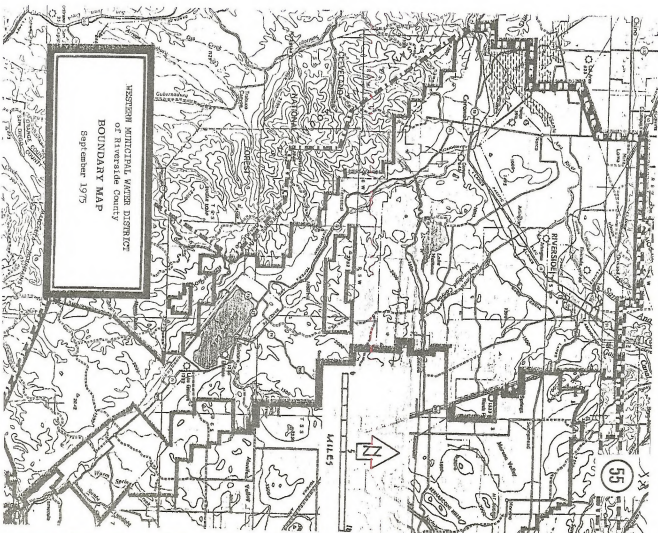
- how vital power is to the production of food as well as vital
- the increasing demand for electrical power;
- the lack of other immediate alternative sources of power; and
- the length of time required to place a power plant on line, once it has received all necessary approvals.

Unless the project results in real and significant negative impacts on the environment, we would support the construction of this project.

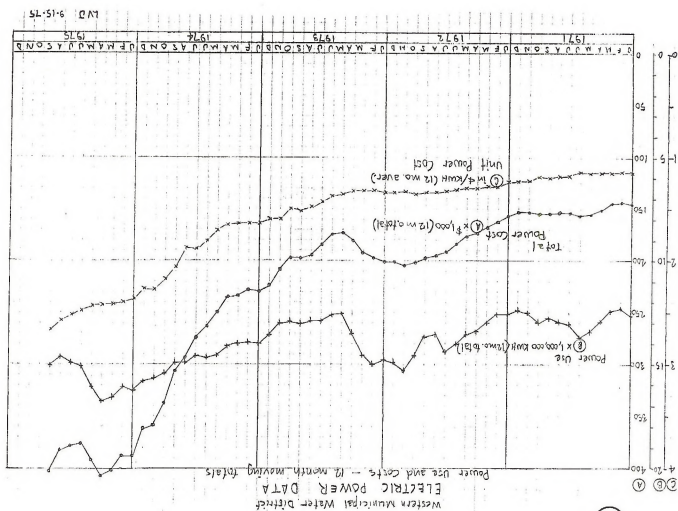
L.V.I.
LAWRENCE V. JONES
Assistant General Manager
and Chief Engineer

LVI/e
Enclosures

55



55



IX-51-6

California
MILLIE CAMP

California
JULIA CHAMBERLAIN, Phoenix

California
WILLIAM H. BATES, Fresno

California
CHARLES J. ROBERT, O.A. Lake

California
ANTHONY C. EVANS, Hayward

Director
BOBBER J. LAMONT

Chief of Bureau
PHIL A. COOPER

Asst. Director, Bureau
DOCK E. GREENWALD



ARIZONA GAME & FISH DEPARTMENT

2222 West Glendale Road Phoenix, Arizona 85021 947-3000

October 6, 1975

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Mr. Paul L. Howard

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October 6, 1975

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Mr. Paul L. Howard
State Director
Utah State Office
Bureau of Land Management
P.O. Box 11609
Salt Lake City, Utah 84147

Dear Mr. Howard:

Personnel of the Arizona Game and Fish Department have reviewed the Draft Environmental Impact Statement for the Kaiparowits Energy Project. After a lengthy review, the Department has reached the conclusion that the environmental ramifications of this proposal are enormous, and for the most part, incomprehensible.

Our Department is concerned as to the reasons why we were not consulted to any large degree during the preparation of this DIES. We were not invited to work out the various transmission line alternatives, nor were we given sufficient time to assess the information going into the DIES. Had we been contacted more often, we feel that the wildlife data in the report would have been more complete.

Our Department cannot support the Kaiparowits project as proposed. It would degrade one of the most remote scenic areas of the United States. Kaiparowits would be located in one of the greatest concentrations of national parks and other scenic wonders found anywhere in the United States. The proposed transmission line area in the Golden Circle of national parks and monuments. It also includes recreation area, a national forest, and millions of acres of scenic areas under the jurisdiction of the Bureau of Land Management or the Navajo Tribal Council. Visibility is usually very high and noise levels are minimal. As described in Volume II-207 and 208, there would be a good possibility that dense visual air pollution would drift into outstanding scenic areas in Arizona - the Kaibab National Forest, Grand

Canyon National Park, Monument Valley, and Glen Canyon National Recreational Area. Within a 200 mile radius of Kaiparowits lie eight national parks and three national recreation areas - one-sixth of the National Park Service's total acreage.

No new microwave stations should be installed on mountain tops or anywhere with associated roads. Patch action, in effect, would degrade the mountain's esthetics and wildlife resources.

We are concerned with the possibility of smoke drifting down the Colorado River into the Grand Canyon. We are of the opinion that it would be ridiculous and ludicrous for the American people to permit a smog problem in the Grand Canyon. It is possible that the proposed project might create a permanent haze over the entire Lake Powell-Grand Canyon region, making it the most polluted mountain area in the country. A total of five coal-burning plants are proposed for the area. The cumulative effects of these and the existing plants were not taken into consideration in the DIES.

With regard to Lake Powell, officials of the Department of Interior stated that the proposed Kaiparowits Power Project water requirements would result in additional withdrawals from the Lake. This would result in vastly reduced flows of water in the Colorado River. River water users.

The DIES also points out in Volume III, pages 153-154, that the already high mercury levels in Lake Powell would be increased. Department of Interior officials say that naturally occurring mercury levels in the lake are already so high that the additional mercury from the fish would become unfit for human consumption. Volume II-191 states, "Fishing is excellent, particularly for largemouth bass and crappie. The combination of good fishing and spectacular scenery attracts large numbers of fishermen from a wide multi-state area". The plant, with its smoke, land roads, mines, pipelines, transmission lines and waste disposal areas, would have a severe environmental impact on Lake Powell and on people who enjoy the lake.

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The following sentences come from Volume I-240 of the DES "Access roads would consist of a main road running the length of the transmission line right-of-way with stub roads providing access to each structure site.

We would be extremely concerned with the placement of this many miles of access roads into pristine areas. Previously undisturbed areas would be left open to human intrusion and encroachment. In addition, past experience has demonstrated that access roads inevitably lead to more access roads. A scientific pattern is usually created that eventually subdivides and mays the country. A point is reached where the habitat is reduced in quality for much of the wildlife. One of our big concerns is that the DWS failed to discuss where along the transmission lines these access roads would be established. They could be constructed in very critical wildlife or scenic areas.

Kaiparowits-Phoenix Transmission Line

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The conflicting twin 500 KV Navajo transmission lines would parallel 2,000 feet from the proposed Kaiparowits-Phibson route. Those lines have already had excessive adverse impacts upon many deer and antelope herds on Glenrose, Perry's, and Black Meats. A fourth cross critical antelope, deer, and elk wintering range, the 2,000 feet of Highway 66 near Williams, Another 500 KV line, line 2,000 feet away from the existing 500 KV line, would require building as much on wildlife. The 2,000 foot separation would require building as much on wildlife. The 2,000 foot separation would require building as much on wildlife. The 2,000 foot separation would require building as much on wildlife.

To preserve and protect existing wildlife habitat, it would be desirable to build along the proposed Knapptonville-Pikeville road corridor between KY Routes 67^E and 68^E, and Kitchell and Peachcroft National Forests and across bylines 1^A and 2^B. The proposed transmission lines are located south of Black Mesa north of National Forest and across byline 3^A. From there, the proposed transmission lines could follow KY Route 68^E through the forest and cross byline 4^A. The proposed transmission lines could be constructed and installed by helicopter. The reason for this procedure is the protection of critical deer, elk, and antelope winter range immediately north and south of Highway 68^E near Williams and across the three meads. The meads are extremely

Mr. Paul L. Howard

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October 6, 1975

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Important antelope and mule deer lawning grounds. Another access road across these meadows could eliminate the antelope herd and greatly reduce the deer population. These areas were seriously impacted by the twin 500 KV Navajo Project power lines access road.

Kilnerowits-Moenkopi-Mohave

It would appear from reading the DES that all of Arizona west of State Route 64 is a wildlife desert that contains only a small area of elk habitat. The "cervidae" elk habitat outlined on the map in Volume II-195 east of the Hualapai Indian Reservation contains no elk. However, elk do occur on the Hualapai Indian Reservation. Antelope inhabit most of the route from Highway 64 to the Cottonwood Cliffs. As a matter of fact, the portion of the proposed route of the most important antelope range in the area is crossed by the proposed route. Although trophy buck hunting areas in the west. Since antelope are not identified as occurring in this area, no impacts on the animals are considered nor any mitigating measures recommended. The DES gave no information on antelope that could be used to make rational decisions.

Male deer occur in a discontinuous manner throughout the proposed route from Highway 64 to the Colorado River. They were not considered or even mentioned in the report; however, they occur in the phino-jumper vegetative type between highway 64 and the Hualapai Reservation. The desert bighorn sheep range is located in the Hualapai and Hualapai Mountain Ranges. The Pascock and Hualapai Mountains produce a sizable portion of the northern Arizona legal buck harvest. This species is a very important game animal throughout the proposed route from Highway 64 to Kingman.

Mountain lions in the DES were designated only as possible transient inhabitants of the Cottonwood Cliffs. On the contrary, they are residents in the Cottonwood, Pascock, Hualapai, and Black Mountain Ranges; additionally, they are found in the more rugged areas between Highway 64 and the Hualapai Indian Reservation. The Kianic Mountain-Cottonwood Desert area probably supports one of the largest mountain lion populations in Arizona.

Desert bighorn sheep constitute year-long residents along the proposed route in the Black Mountains. This is not just a migration route. Though bighorns were mentioned as occurring here, there was

Mr. Paul L. Howard

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October 6, 1975

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no consideration of these sheep when the impact of the line was discussed. This species is unique, is very sensitive to disturbance, and occupies shrinking habitat. It deserved better consideration in the DES.

Mourning doves are year-long residents of the Mohave desert. Gambel's quail occur along the entire proposed route from Highway 64 to the Colorado River in all three mentioned vegetative types. The reader gets the impression from Volume II-204 that this species does not occur in the phino-jumper or desert grassland vegetative types.

Most of the vegetation in the desert bighorn sheep range is climax, not lower successional stages as inferred in Volume II-163.

The DES did not print many facts concerning wildlife. All of these shortcomings could have been averted had the writers conferred more with Arizona Game and Fish Department personnel prior to writing the report.

The major objection that we have to the proposed Moenkopi-Mohave route is the section that crosses new country from the Hualapai Reservation to the Cottonwood Cliffs. This area presently contains some of the best trophy hunting areas in the state. We do not favor another road there.

If this transmission line must be built, we would prefer that it follow the Mohave Generating Station coal slurry line. The slurry line passes near the Moenkopi switching station and goes directly to the Mohave switching station. The line currently has a good access road along the entire length and considerable right-of-way has been cleared. This should minimize the vegetation disturbance necessary to build the proposed power line.

Some of the more scenic areas that would be affected by the proposed route are the Aubrey Cliffs, the Grand Wash Cliffs, and Red Lake.

The Arizona Strip Transmission Line

The Arizona Strip, which includes the Kaibab Plateau, constitutes one of the most unique areas in Arizona. Its intangible values cannot be measured.

Mr. Paul L. Howard

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October 6, 1975

The Strip is the best deer producing area in the state. Historically, it has produced the best and largest antelope in the world. Our Department has reintroduced antelope and turkeys into the area with considerable success. Successful small game transplants have included chukars and Kaibab squirrels.

The Strip has a "park quality atmosphere" about it. Its scenic and esthetic beauties are something to behold due to its tremendous expansive vistas.

The Bureau of Land Management recently declared the Virgin Mountain section of the Strip as the Paiute Primitive Area. It may eventually be a wilderness area. The access created by a transmission line into this pristine country would be extremely undesirable. It is possible to see into four states from the Virgin Mountains - Arizona, California, Nevada, and Utah. This experience would be spoiled by the presence of a transmission line and an access road.

The existing transmission line on the Strip has presented enough access problems. This new proposal appears as if it would not even follow the present corridor. Another line could have a great impact on the deer and antelope. We cannot support, nor should Arizona tolerate any new power lines on the Arizona Strip - one is enough.

In view of the potential environmental effects of the proposed Kaiparowits Energy Project, our Department would like to propose several alternates to the coal-fired power plant system. These are only suggestions; we do not pretend to have the engineering expertise to determine their feasibility. We will leave their practicality to experts in other fields. However, we do feel that these alternates would be more beneficial to the wildlife and esthetics of Arizona.

California Nuclear Plants

We feel that nuclear plants in California would be the best way for California to solve its energy "problems". Passing a referendum in California to outlaw the construction of these facilities would be moot. The plants would just have to be constructed somewhere else. Southern California Edison presently has plans for tapping the proposed nuclear power plant near Buckeye, Arizona. Our Department supports nuclear power plants as a source of energy. We see no reason why California shouldn't have more of their own plants.

Mr. Paul L. Howard

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October 6, 1975

A Coal Gasification Plant

Possibly one of the best alternates for the proposed coal-fired plant in terms of environmental preservation would be the construction of a coal gasification plant on the Kaiparowits Plateau. The coal deposits of the area could still be utilized.

A coal-gasification plant would eliminate the need for habitat degrading transmission lines with their access roads. The gas produced could be shipped out through underground pipelines, which could follow existing pipeline corridors. Southern California has the facilities to burn gas, so this would not create a problem.

The amount of air pollution would be considerably less with a coal gasification plant. Arizona does not want polluted air any more than Southern California. A plant of this type would prevent the many scenic wonders of the area from becoming encased in a pall of smoke. In addition, the threat of mercury pollution would be reduced in Lake Powell.

The water efficiency of a coal gasification plant is apparently much better than that associated with the operation of a coal fired plant, according to Mr. Harold Sersland, Bureau of Reclamation, Salt Lake City, Utah (telephone conversation 9-29-75).

An Upgrading of the Mohave Generating Station

This alternative was presented in the DES. The generating capacity of the Mohave plant in Nevada near Davis Dam on the Colorado River could be upgraded to meet the necessary energy requirements.

The two transmission lines supplying power to Southern California could originate there. They and their habitat-degrading access roads would not pass through Arizona. A powerline to Phoenix could follow the existing USBR corridor without disrupting any new wildlife habitat.

Certain measures would still have to be taken to protect the environmental integrity of that area of the Colorado River Basin. The newest and most efficient precipitators would have to be installed on each power unit. Otherwise, 8-10 units would further contribute to

Mr. Paul L. Howard

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October 6, 1975

pollution of air in that area. The lone unit presently operating at the Mohave station already puts out too much pollution because of an insufficient precipitator. Smoke pollution would become a real serious problem in the Colorado River Basin if stringent particulate regulators were not used.

Another detrimental aspect of enlarging the Mohave facilities would be the amount of water drawn out of the Colorado River. Much of this would have to come out of California's designated allotment. Cooling ponds would have to be constructed at the site to prevent an excessive amount of hot water from being returned to the Colorado River. Thermal pollution could destroy or seriously alter aquatic life in the river.

Summarizing our comments on the DES, we cannot support the proposed Kaiparowits Power Project. The Rocky Mountain states should not have to sacrifice their environmental integrity for the problems of another area. Surely the solution must lie somewhere in Southern California.

We appreciate the opportunity to review and offer comments on this draft environmental impact statement. Please contact us if further input is desired.

Sincerely,



Robert D. Curtis, Chief
Wildlife Planning & Development Division

RDC:ab

Enclosure

cc: Constance LaMonica,
Arizona State Clearinghouse

State could be site of nuclear plants serving California

By GRANT E. SMITH

Even if opponents are able to halt construction of the Arizona Nuclear Power Project's proposed plant near Puckey, the state still could be the site of nuclear plants feeding electricity to California.

California voters will decide next June on a measure that could ease the

state's nuclear plants and prohibit the construction of any new plants.

California utilities then would have to look to other sources to satisfy the state's increasing demand for electricity. There are two strong possibilities:

— Nuclear plants on Indian reservations in Arizona.

— Coal-fired plants along the Colorado River.

Whichever alternatives the California utilities pursue, they probably will have to look outside the state because California's air-pollution laws prohibit the construction of coal-fired plants.

Thus, Arizona and other neighboring states could be called upon to bear the burden of generating electricity for California.

How much electricity will California need?

San Diego Gas and Electric Co., for example, estimates that its peak demand will more than double by 1985 and, as a result, the utility estimates that it will have to move from double its generating capacity.

Southern California Edison Co., which serves the Los Angeles area and recently became a participant in the Arizona nuclear project, estimates that its peak demand will increase 35 per cent by 1985 and says it will need a 51 per cent increase in generating capacity by 1984.

According to figures supplied by the utilities for the environmental impact statement on the Kaiparowits power project, each of the California utilities plans to have 14 per cent of its generating capacity in nuclear power by 1984.

By then, they plan to have 2,555 megawatts supplied by nuclear power, all of which would be generated in California. The figures for the impact statement were submitted before Southern California Edison joined the Arizona nuclear project.

The proposed Arizona nuclear project is being designed to generate 2,510 megawatts. The Kaiparowits project, a proposed coal-fired plant in southern

Continued on Page B-1

about

Nuclear plants in state

Continued from Page B-1

Utah is being designed to generate 2,600 megawatts.

Thus, these two utilities, out of the scores in California, would need a plant the size of the proposed reactor plant to make up for their losses if nuclear plants are outlawed in California.

A study prepared for Rep. Clare Burgener, R-Calif., on the impact of nuclear ban estimates that for state would have to replace at least 8,000 megawatts of generating capacity if demand remained at present levels.

The study, prepared by the Library of Congress, estimated that if California maintained its current growth rate an additional 12,340 megawatts of capacity would be needed by 1985.

That would mean California would have to add about 25,000 megawatts or the equivalent of 2½ of the proposed Arizona nuclear plants.

Where would such plants be?

Southern California Edison admits it is investigating the possibility of building a plant on the Colorado River Indian Reservation, which runs along the Arizona side of the river south of FortHuachuca.

"The studies are very preliminary," a utility spokesman said. "We have no project in mind at this time."

Similar studies have been made of the Mohave Indian Reservation, which runs along the Arizona side of the river south of Bullhead City, but also runs across the state line into Nevada.

Both the reservations have rights to Colorado River water, which could be used to cool the generating plants.

The availability of water would limit the location of generating plants because such plants use large amounts of water for cooling and for steam.

However, if water were available, there is a great potential for more coal-fired power plants in the northern part of the state.

An estimated 12 million tons of coal a year is being mined from the Black Mesa in the Hualapai and Navajo reservations in northern Arizona. This coal feeds both the Navajo and Mohave power projects.

These two plants are designed to generate a total of 2,700 megawatts; eventually, 1,683 of which will go to

either Southern California Edison or the Department of Water and Power of the City of Los Angeles.

If the two power plants have a normal useful life of 35 years, they may consume about 500 million tons of coal from Black Mesa.

Geologists say there may be as much as 21 billion tons of coal in the mesa.

There also are vast deposits in Utah.

If pollution and social problems are overlooked, the only constraint to further development of the area for electrical generation is water from the Colorado River, whose supply is strained.

The Navajo plant already is using most of Arizona's Upper Basin allotment of river water. About 6,000 acre feet is left, and this is not considered sufficient for another generating plant.

What is the measure that may force California utilities to depend more on electricity generated in other states?

Early this year petitions bearing more than 300,000 signatures were filed to get a nuclear power plant initiative on the California ballot.

The drive was supported by such individuals and groups as Ralph Nader, the Sierra Club, Another Mother for Peace, Jack Lemmon, Steve Allen, Donna Reed, Friends of the Earth and the California Citizens Action Group.

If approved by voters next June, the measure would not specifically ban nuclear plants in the state, but utility officials say compliance with the measure would make operation of a nuclear plant almost impossible.

Plants would not be granted land-use permits unless:

—Congress removed the current limits on total liability in case of an accident. The current liability ceiling is \$50 million.

—The effectiveness of all safety systems was demonstrated within five years. As yet, there has not been a full-scale test of the emergency core cooling system.

—The California Legislature, by a two-thirds vote of both houses, determined that radioactive wastes could be stored or disposed of in a manner that would not adversely affect the land or the people.

Should the conditions not be met:

—New plants could not be built.

—Existing plants would have to be cut back to 50 per cent output in five years and phased out with a 10 per cent power reduction each year for the next six years.

—Plants under construction could be started only at 60 per cent capacity and would have to be phased out.

The study authored for Rep. Burgener

nuclear plants would cost California electrical users about \$1 billion and that the replacement of generating facilities would add \$4 billion to \$10 billion to their electric bills.

For the neighboring states, it could mean an added pollution burden and increased possibility of nuclear accidents.

"We are assuming the initiative will be too difficult to implement," said Fred English, head of the Arizona Open Energy Coalition. "However, if it does pass and go into effect, we have been told the California utilities will be looking to Arizona for possibly 10 plant sites."

Christmas Seal Campaign

for the prevention and control of lung diseases

October 9, 1975

Mr. Paul L. Howard
U. S. Bureau of Land Management
125 S. State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

I have just completed reading the Environmental Impact Statement re the Kaiparowitz Project. Although verbal and written testimony was submitted before a joint committee of the Bureau of Land Management and the Department of the Interior, I take this opportunity to submit additional remarks.

The Impact Statement on the Kaiparowitz Project contains virtually no substantive section on the health effects of air pollution generated as a result of the project. It is a serious omission and thus should not be acceptable. Medical and scientific data is being released almost monthly on the effects of excessive air pollution on lung disease patients, on the elderly, or on asthmatics and small children. Impact statements, including Kaiparowitz, have little else but historic significance in light of the rapidity of newly discovered scientific information.

The risk of permitting the release of hundreds of tons of pollutants per day, be it from Kaiparowitz or any similar source, are great. No prudent position now will result in depressing health problems within a decade. Reiterating, the Impact Statement on the Health Effects of Air Pollution re Kaiparowitz is at best inadequate. It should not be accepted nor should future plans on the building of the Kaiparowitz be continued.

Sincerely,

Ben Chaiken
Ben Chaiken
Executive Director

BC:lm
Enc.



ARIZONA LUNG ASSOCIATION

1239 E. McDowell Rd., Phoenix 85006 • 2819 E. Broadway, Tucson 85716

Affiliated with AMERICAN LUNG ASSOCIATION, formerly National Tuberculosis and Respiratory Disease Association

ON THE KAIPAROWITZ PLANT

"Recent laboratory investigations indicate that air pollutants are capable of: 1) increasing susceptibility to respiratory infections; 2) inducing the abnormalities of chronic bronchitis; 3) setting the stage for development of pulmonary emphysema; and 4) aggravating the physiological changes of patients with chronic respiratory diseases. "Numerous epidemiological studies have confirmed that these adverse effects do occur in the real life situation. Available data suggest that the severity of the effects is related to the level of air pollution. There is, as yet, no conclusive evidence that a safe 'threshold level' exists." Arizona Medicine, August 1973, Air Pollution and Respiratory Illness, Michael D. Lebowitz, Ph.D., Benjamin Burrows, M.D. The paper just quoted was supported by 38 bibliographies from persons equally qualified to speak on the health effects of air pollution.

Over the last several decades a demographic shift has occurred in communities in the U.S. Large cities have become larger; small cities and towns have lost population. One of the major groups who have migrated and continue to migrate to large cities is the younger population -- let us say those under 30 years of age. With the younger big city population has some increased birth rates and all other elements attributable to younger people. The percentage of young people in large city populations has increased over the years.

Small cities and towns which have an appreciable exodus of young people have a correspondingly higher percentage of older persons making up their population. Statistics will bear out this demographic shift in small cities and towns throughout the U.S.

We can state with a degree of authority that persons comprising the older segment of our population are more sensitive to the effects of air pollution. The same may be said of the very young. Add to the above the great number of cardio-pulmonary

disease found in the populations identified. We are speaking of definitive data born out by statistical and epidemiologic studies.

The Kaiparowitz power plant will spew out hundreds of tons of emissions per day -- every day throughout its existence. The combination of particulates and toxic gases in these amounts are without question excessive. Their effects will be felt on the very young, the elderly and the sick who live in the path of the smoke plumes. Pollution fallout of such substances as particulates, acid rain, sulfates occurs from the moment pollution is emitted and drops in virtually every area in the direction of the smoke plume. Such substances are known to travel hundreds of miles. Obviously, a considerable number of persons are thus exposed. One may predict that with each passing year the susceptible population will succumb to more respiratory illness and higher mortality rates.

The full benefits of the Kaiparowitz plant -- namely power -- will be derived by communities of San Diego and Los Angeles County. This borders on being unfair to those innocents residing in the state of Arizona.

We are for progress and believe that preserving the human condition is the finest example of progress.

We appeal to all to think carefully of the benefits and liabilities of the Kaiparowitz and other contemplated power plants and adopt a prudent position to preserve and protect the society of man.

Ben Chaiken

Executive Director

ARIZONA LUNG ASSOCIATION
1239 East McDowell Road
Phoenix, Arizona 85106

IX-527



October 7, 1975

Mr. Paul Howard
State Director
Bureau of Land Management
U.S. Department of the Interior
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

The draft environmental impact statement "Proposed Kaiparowits Power Project in South Utah", which accompanied your letter of July 29, 1975, has been received by the Department of Commerce for review and comment. The statement has been reviewed and the following comments are offered for consideration.

The hazards to life and property from flooding are recognized on pages I-325, I-328 and II-140 but reference is made to the availability of weather forecasts nor of warnings of flooding from the National Weather Service.

Not mentioning these services which are available Weather Service Offices at Milford, Utah, and Weather Service Forecast Office in Salt Lake City, Utah, is considered an oversight.

Page II-29, lines 14-15 - The term "air pollution potential" is usually considered to be an appropriate meteorological measurement such as the criteria for "extreme conditions". We would suggest omission of the phrase "can be interpreted as an air pollution potential and".

2.

Page II-30, line 5 - The influence of the Navajo Plant is known as a result of the 1974-75 fall and winter SO₂ measurement program. Highest 3-hour concentrations were found on Vermillion Cliffs and Leche Rock although these did not exceed standards when prorated to the eventual operation of 3 units. Nevertheless, it does indicate the importance of the interaction (impingement?) of the plume and high terrain. We would suggest contact with the Navajo Plant operators (Salt River Project) to obtain their results.

Page II-43, 10th line from bottom - Reference should be 372.

Page III-21, Section 3 - On what basis (visible tracer, quantitative plume concentration measurements?) was it concluded that the plume cleared the Vermillion Cliffs? From the Vermillion Cliffs results we would conclude differently.

Page I-23 - Suggest use of metric system throughout

Page I-3, line 9 - Typo, mechanic draft

Page I-248, line 9 from bottom - 150°

We are sorry for giving you an opportunity to provide these comments. We hope you will be of assistance to the Department in receiving ten copies of the statement.

Sincerely,

Sidney R. Galler
Sidney R. Galler
Deputy Assistant Secretary
for Environmental Affairs





REGIONAL COOPERATION FOR REGIONAL PROBLEMS

President
JAMES A. HAYES
Superintendent
Los Angeles County
First Vice President
ROSAMBA SCOTT
Mayor Pro Tem
City of Riverside
Second Vice President
DEBRA D. HARRIS FOLIN
Supervisor
San Bernardino County
Executive Director
RAY REMI

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 City of Thousand Oaks
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 City of Los Angeles
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KALPH A. CROSBY
 Supervisor
 Orange County
GIL JAMES GILBERT
 Chairman
 City of Burbank
W. R. (BOB) HOLCOMB
 Mayor
 City of San Bernardino
FRANK JEWETT
 Supervisor
 Ventura County
MORTIMER J. MATTHEWS

Dear Mr. Howard:

As required by OMB Circular A-95, information regarding the environmental impact statement prepared for the Kaiparowits Project has been made available to the cities, counties and some agencies in the SCAG region. No comments were received in response to the solicitation for comments. The findings of the environmental document have been reviewed by the SCAG Executive Committee for consistency with adopted regional plans and policies and for their relationship to regional planning activities currently in progress. While much of the SCAG review focused on the impacts of the transmission systems on the Counties of San Diego, San Bernardino and Orange, comments were also generated regarding other, more far reaching, impacts.

The SCAG Executive Committee has adopted the following comments regarding the power transmission system and has directed that these comments be transmitted to you for consideration in planning for this project and for discussion in the final environmental impact statement.

"The proposed route, particularly in the Mojave to Devers Substation segment, passes through or near several areas identified as being of regional significance and concern in the draft Regional Conservation and Open Space Plan, and thus may not be in the best interest of regional conservation. The areas to be impacted are the Old Woman, Turtle, Coxcomb, Droopelia and Chuckwalla Mountains. The route then also passes near other proposed areas of regional significance when it passes Joshua Tree National Monument and near the Mecca and Indio Hills. In these areas it

THEODORE S. MAXWELL
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San Joaquin County
LEAMON MURPHY
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Butte County
PAT RUSSELL
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GILBERT SMITH
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City of Salem
JOHN STONE
Commissioner
City of Newport Beach
BRYAN WADE
Mayor
City of Long Beach
DAKTER WARD
Superintendent
Los Angeles County
REUBEN WHITE
Mayor
City of Pasadena
FRANCES WOOD
Commissioner
San Jose

Mr. Paul L. Howard
October 10, 1975
Page Two

appears that strong consideration should be given to an alternate route identified in the draft environmental impact statement as the "BLM Ward Valley Alternative", because while resulting in a small increase in mileage, it would result in fewer conflicts with these areas and would have less potential for environmental disruption. The proposed route from the Devers Substation to the termination of the line, although crossing Cleveland National Forest which is an area of regional significance, is preferable to a northern route which would pass near urbanized areas through Santa Ana Canyon and near the Chino Hills. It is suggested, however, that to mitigate possible environmental impacts in the roadless areas of Cleveland National Forest, the use of helicopters should be considered, and the construction of the system and for its maintenance, rather than constructing access roads.

Additional concerns have been raised regarding the adverse impacts on soils, increased erosion, destroyed vegetation, and reduced wildlife habitat which would result from transmission tower construction. Erosion and soil compaction in the report state ecological recovery time in the desert is of considerable length. Therefore, maximum precautions are needed to ensure the least disruption. This same concern extends to the threats to rare and endangered wildlife species and the potential for increased air pollution. The need for construction and maintenance of the transmission system might open large tracts of California desert for unrestricted recreational use. Based upon past examples of environmental degradation that have occurred with unrestricted recreational use, the report states that additional measures be provided to reduce this environmental degradation.

In addition to the preceding comments, the SCAG Executive Committee is also discussing ways of evaluating the relationship of this and other proposed power projects to one another and to the need for (and supply of) energy in Southern California. Although SCAG is involved in a number of other energy planning stages, we hope to be working closely with agencies such as the California State Energy Resources Conservation and Development Commission and the Federal Energy Administration to evaluate the proposals and their impacts on the environment and economy. The SCAG Executive Committee is also considering whether it is proposed that would affect the SCAG region, the SCAG Executive Committee has requested that, in any evaluation, questions such as those that are outlined below be considered by the appropriate agencies for each project as well as for the total number of proposed projects) before projects are approved for construction:

Mr. Paul L. Howard
October 10, 1975
Page Three

- What are the specific factors and assumptions that are considered in forecasting energy demand for Southern California and how can these factors be evaluated in terms of adopted regional policies? In this vein, how would changes in consumption patterns (such as recent examples of voluntary conservation of energy or the possibility of government enforced conservation) affect the amount of energy needed in Southern California and how would this affect the needed scheduling of generating facilities?
- How much reserve capacity do the utilities currently have and how much do they need?
- Once information is available regarding the projected demand for energy, the following types of questions should be answered regarding the proposed supply of energy so that an overall picture can be developed:
 - What are the projects currently being proposed and where are they located?
 - What is the total proposed generating capacity and what would be the relationship of this source of energy to other sources currently available (e.g., what effect would these projects have on the need for petroleum or natural gas?).
 - What energy and environmental resources (and in what quantity) would be used to generate this additional energy?
 - Which jurisdictions, and how many people in these jurisdictions, would the plants serve?
 - What are the environmental impacts of one proposed project and/or a series of projects vis-a-vis the other projects that are being considered and which projects would have the least detrimental environmental impact? Further, what are the relative needs and impacts of the projects (i.e., could the construction of one plant in a relatively isolated area replace another project which would have greater environmental and social impacts on the population?).

While members of the SCAG Executive Committee have voiced a number of other questions, these give an indication of the concern that the issue of energy production be approached in a manner that will avoid either an energy shortage or wasteful excess production as well as avoiding serious environmental degradation.

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Mr. Paul L. Howard
October 10, 1975
Page Four

Clearly the development of an overall picture of the availability of current resources, the necessity for new resources, and the impacts of proposed generating facilities is essential if elected officials and other decision makers are to choose the best possible proposals. Until such time that this type of information is available, the SCAG Executive Committee is unable to comment positively or adversely on the overall desirability of the Kaiparowits Project. While we realize that the development of this information will require much effort, such information is necessary and we look forward to providing whatever data we may have that will assist in this effort.

If we can be of assistance, please advise.

Sincerely,

Ray Remy
Ray Remy
Executive Director

RR:LR:b1

cc: California State Energy Resources Conservation and Development
Commission

Federal Energy Administration

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IX-530



ARIZONA MINING ASSOCIATION

100 WEST CLARENDON • SUITE 1720 • PHOENIX, ARIZONA 85013 • (602) 266-4430

J. R. RICHARDSON
President

60



Corona Chamber of Commerce

October 14, 1975

Mr. Paul L. Howard
State Director
Bureau of Land Management
P. O. Box 11505
Salt Lake City, Utah 84111

Re: 2850 (U-913) Kaiparowits

Dear Mr. Howard:

We fully support the Kaiparowits Project, as outlined in the above referenced material.

In view of the extensiveness of the content of the environmental impact statement draft, we have genuine concern as to the level of interference by governmental and outside private agencies into the proper and efficient management of the Project. We are further concerned, as representatives of major power users in Arizona, that this interference will increase the already burdensome costs connected with this project through undue and unnecessary environmental concerns. These costs must be eventually borne by someone and, as a cost of doing business, will be directly or indirectly passed on to the consumers of the power to be generated by this project. Inasmuch as there is a high degree of governmental regulation in the power business, one of the areas of utmost concern to the various regulatory bodies should be to keep power consumer rates at the lowest possible level, and not to add to the spiraling of energy costs by instituting increased cost regulations.

Thank you for your consideration of these thoughts into the final draft of this project.

Very truly yours,

Erland G. Johnson
Erland G. Johnson

EGJ/vm

OCTOBER 8, 1975

DEPARTMENT OF INTERIOR
UTAH STATE DIRECTOR
BUREAU OF LAND MANAGEMENT
125 SOUTH STATE STREET
SALT LAKE CITY, UTAH

RE: THE KAIPAROWITS POWER PROJECT

AT THE HEARING ON THIS MATTER IN SAN BERNARDINO, CALIFORNIA, ON SEPTEMBER 19, 1975, THE ATTACHED LETTER MAILED TO WASHINGTON, D.C. WAS READ INTO THE RECORD. AT THAT TIME ONE OF THE PANEL MEMBERS INQUIRED IF WE HAD A FORECAST AS TO WHAT THE POWER NEEDS WILL BE IN THE FUTURE FOR OUR AREA. AT THAT TIME WE DID NOT HAVE SUCH A FORECAST, AND IT WAS REQUESTED THAT IT BE MAILED TO YOUR ATTENTION.

I AM ADVISED THAT THERE WAS AN ORIGINAL FORECAST IN 1974 FOR AN INCREASE OF 5.14% FOR THE CORONA AREA FOR THE NEXT FIVE (5) YEARS. HOWEVER, BECAUSE OF THE ACCELERATED GROWTH FOR OUR AREA, THE FORECAST HAS BEEN REVISED UPWARDS TO 7% FOR THE NEXT FIVE (5) YEAR PERIOD. THIS AGAIN IS SUBJECT TO A FURTHER UPWARD REVISION BECAUSE OF OUR UNIQUE GROWTH POTENTIAL DUE TO OUR GEOGRAPHIC LOCATION NEXT TO THE LOS ANGELES AND ORANGE COUNTY AREAS.

I TRUST THAT THIS INFORMATION WILL BE INCLUDED IN THE RECORD AND THAT IT WILL BE HELPFUL IN MAKING YOUR DETERMINATION ON THIS MATTER.

Russ Gauslin
RUSS GAUSLIN, PRESIDENT
BOARD OF DIRECTORS
CORONA CHAMBER OF COMMERCE



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
REGION EIGHT

62

Form FHWA 121 (Rev. 5-73)

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
Utah Division

62

DATE: September 23, 1975

In reply
refer to: 08-49,21

October 16, 1975

(U.S. DEPT. OF TRANSPORTATION)

08-00.21

Mr. Paul L. Howard
State Director
Bureau of Land Management
P.O. Box 1150
Salt Lake City, Utah 84111

Dear Mr. Howard:

Subject: Draft EIS, Kaiparowits
Project (5 Volumes)

TO : Mr. Daniel Watt
08-00.21 Regional Federal Highway Administrator
Denver, Colorado

SUBJECT: Utah DEIS - Proposed Kaiparowits Project
EIS Prepared by Another Agency
(5 Volumes)

FROM : Assistant Division Administrator
Salt Lake City, Utah 84147

Your memorandum of September 16, 1975, forwarded the above DEIS for our comment.

We have worked closely with the local BLM Office during final preparation of the DEIS and have had some input into the document. Copies of three memorandums sent to BLM and their reply are attached for your reference. Our concern with the statement has been that it should address environmental considerations of the access road, as well as project circulatory roads, sufficiently that no further environmental statement would be necessary in the event Federal Highway administered funds later become available for road construction. As part of this effort, we have accepted BLM as the lead agency for EIS preparation as provided by FHWA 7-7-2, paragraph 7.

Our memorandum of May 20, 1975, suggested that the environmental impacts of the access road were not covered. When the DEIS was published, the impacts still were not covered. We have discussed this matter with BLM representatives and followed with our September 10, 1975, memorandum. BLM State Director Paul L. Howard is in agreement that the access road impacts should be covered and also agrees that due to oversight, they have not been. It is proposed to include this coverage in the final EIS.

Our comments on the DEIS are contained in the attached three memorandums. The document is very long and comprehensive, and we have limited our comments to access highway considerations. The draft EIS is returned as you requested.

William A. Weseman
William A. Weseman

Attachments

Sincerely,

F. S. Allison
F. S. Allison, Director
Office of Environment and Design

Attachments

We have reviewed the subject draft EIS and offer the following comments:

Our Division Office in Salt Lake City has worked closely with the local BLM Office during final preparation of the DEIS and had some input into the document. Copies of three memorandums sent to you and your reply are attached for your reference. Our concern with the statement has been that it should address environmental considerations of the access road, as well as project circulatory roads, sufficiently that no further environmental statement would be necessary in the event Federal Highway administered funds later become available for road construction. As part of this effort, we have accepted BLM as the lead agency for EIS preparation as provided by FHWA 7-7-2, paragraph 7.

Our Division Office memorandum of May 20, 1975, suggested the environmental impacts of the access road were not covered. When the DEIS was published, the impacts still were not covered. Our Division Office has discussed this matter with BLM representatives and followed up with their September 10, 1975, memorandum. We understand you are in agreement that the access road impacts should be covered and also agree that due to oversight, they have not been, but will be included in the final EIS.

Our comments on the DEIS are contained in the attached three memorandums. The document is very long and comprehensive, and we have limited our comments to access highway considerations.

IX-552

Utah Division
P.O. Box 11563
Salt Lake City, UT 84147

September 10, 1975

08-49.21

Mr. Foul L. Howard
State Director
Bureau of Land Management
P.O. Box 11505
Salt Lake City, Utah 84111

Dear Mr. Howard:

Subject: Environmental Impact Statement
Kaiparovits Project, 2850 (U 933)

By our memorandum of May 20, 1975, we commented on the draft summary of the above EIS. Our concern was that material available at that time did not adequately address the environmental impacts of the access road.

We have now reviewed the draft environmental impact statement and have discussed with you the items which we believe will still need to be included to meet NEPA requirements.

On September 2, 1975, we met with you and your staff along with representatives of the Utah Division of Transportation. A Follow-up meeting was held with your staff on September 8, 1975, to discuss the general areas where we believe additional coverage is necessary.

The areas of concern are as follows as they apply specifically to the access highways.

Air Quality
Noise
Water Quality
Historical and Archeological Sites
Section 4(f) or Park and Recreation Lands

Your staff suggested that Bureau of Land Management guidelines for EIS coverage of some of the above items may be deficient as applicable to highway concerns, and requested copies of Federal Highway Administration guidelines. Available material was given to Mr. Wagner after the meeting.

-more-

We will be pleased to discuss further with you the recommendations we have made and will work with you to help assure that the requirements of NEPA are met in the final EIS.

Sincerely yours,

For: [Signature]
George W. Bohn
Division Administrator

ECTurnidge:cu

-2-



United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Utah State Office
Post Office Box No. 21505 I
Salt Lake City, Utah 84111

MAY 22 1975

62

BY REPLY REFER TO

2850
(U-933)
(U-911)
Kaiparowits

TO:

62

UT/H DIVISION
125 South State Street
P.O. Box 11563
Salt Lake City, Utah 84111

May 20, 1975

08-49,21

Mr. George W. Bohn
Division Engineer
Federal Highway Administration
P.O. Box 11563
Salt Lake City, Utah 84111

Dear Mr. Bohn:

You are correct in your understanding that the environmental impact statement for the Kaiparowits project will include the analysis for the new highway. Further, I concur that it would be highly desirable and cost effective to ensure that all Federal actions are covered under this statement.

Accordingly, I concur in the acceptance of lead agency designation under the content of paragraph 7 of your Federal Aid Highway Program Manual 7-7-2. It is my understanding that this concurrence will permit you to review our draft and final statement under of Bureau of Land Management procedures and criteria and that this will satisfy Federal Highway Administration NEPA requirements should Federal funding be made available for all or part of the road system.

We are in the final stages of completing the draft statement and will forward a copy to you for your review. Should you find omissions or errors in the draft, we will work with you to ensure that all points are covered in the final statement so that the acceptance by BLM of lead agency responsibility will satisfy your requirements.

Sincerely yours,

Blaine Kay
State Director

cc: Blaine Kay, Dept. of Highways

Mr. Paul L. Howard, State Director
Bureau of Land Management
P.O. Box 11505
Salt Lake City, Utah 84111

Dear Mr. Howard:

SUBJECT: Environmental Impact Statement
Kaiparowits Project
2850 (U 933)

We have reviewed the draft summary of the Kaiparowits project EIS dated January 1975 and have discussed some aspects of the statement with Mr. Gene Day.

Material furnished to the Federal Highway Administration included a location and feasibility study for access roads to serve the plant. The study was prepared by the Utah Department of Highways.

Review of the material available indicates that the environmental impacts of access roads have not been addressed. It would appear necessary to do so to meet the requirements of the National Environmental Protection Act.

Sincerely,

GEORGE W. BOHN

George W. Bohn
Division Engineer

SCR:cel

cel



Save Energy and You Serve America!

UTAH DIVISION
125 South State Street
P.O. Box 11563
Salt Lake City, Utah 84111
May 9, 1975

08-49.2

Mr. Paul Howard
State Director
Bureau of Land Management
P.O. Box 11505
Salt Lake City, Utah 84111

Dear Mr. Howard:

The Federal Highway Administration is aware that the Bureau of Land Management is preparing an Environmental Impact Statement for the Kaiparowits project in southern Utah.

At the present time, the Federal-aid highway system does not include new routes which would serve this project. Therefore, Federal-aid Highway funds are not available for financing the new highway between Glen Canyon City and Cannonville.

It is our understanding that the Environmental Impact Statement being prepared will include an environmental analysis for the new highway. The will of Congress to provide future Federal funding for access to new energy developments is not known. In the event that future Federal-aid funding does become available, the utilization of your Environmental Impact Statement to satisfy Federal Highway Administration responsibility under the National Environmental Policy Act would be highly desirable and cost effective.

As discussed with Mr. Gene Day on April 30, 1975, we propose that the Bureau of Land Management be designated as lead agency under the content of paragraph 7 of our Federal-aid Highway Program Manual 7-7-2 (copy enclosed for your ready reference). Bureau of Land Management procedures

-more-

-2-

and criteria would continue to be used as the basis for development of the Environmental Impact Statement and the Federal Highway Administration would offer input and review comments as appropriate.

We would appreciate your consideration and response to the above.

Sincerely,

GEORGE W. BOHN

George W. Bohn
Division Engineer

Enclosure

WAM:mbm

(Handwritten signature)

IX-535

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

63

WESTERN REGION
P. O. BOX 52001, WORLDWAY FREIGHT CENTER
LOS ANGELES, CALIFORNIA 90051



October 16, 1975

Mr. Paul L. Howard
Utah State Director
Bureau of Land Management
P.O. Box 11505
Salt Lake City, Utah 84117

Dear Mr. Howard:

The draft Environmental Impact Statement of the proposed Kaiparowits project has been reviewed and the following comments are offered:

1. Since the draft does not indicate the exact location of the power transmission lines, it is difficult to determine the effect on our facilities. Therefore, we recommend that the Department of Interior obtain the locations of all electronic facilities from Electromagnetic Compatibility Analysis Center (ECAC), North Severn, Annapolis, MD, 21407 (phone: 301 267-2415). ECAC can furnish the effect that the power transmission lines will have on the electronic facilities provided the Department of Interior furnishes the coordinates for the power transmission lines. We would like to have a copy of the report from ECAC to verify the effects on our facilities.
2. Prior to construction of the transmission lines, a notice must be filed pursuant to Part 77 of the Federal Aviation Regulations to determine the effects that the proposed transmission lines would have on the adjacent airports.
3. Re Chapter V, page 59. The FAA has no record of an airport existing at Glendale, Nevada. The Glen Ivy Hot Springs airport has been abandoned.
4. An Airport System Plan for Clark County Nevada that was completed by the County in December 1974, identified the El Dorado Valley as a potential site for an airport to serve the Las Vegas Area. A Master Planning effort is underway to determine if McCarran Field at Las Vegas is capable of expansion to accommodate the forecasted demands of Clark County. In addition, the National Airport System Plan recommends a new airport to serve Boulder City, Nevada. Although a site has not been selected, a location in El Dorado Valley may be under consideration. Since the decision to locate and develop airports rests with the local governments, it is suggested that the officials of Clark County and Boulder City, Nevada be consulted to determine if the proposed

2.

transmission lines would conflict with their proposed airport planning.

We appreciate the courtesy extended in bringing this matter to our attention.

Sincerely,


W. BRUCE CHAMBERS
Regional Planning Officer

63

955-11-576



INTEGRATED

64

October 16, 1975

Dear Mr. Woody:

On behalf of the Cactus and Succulent Society of America, I would like to express concern in regard to the Kaiparowits Environmental Impact Statement Draft's treatment of native vegetation. It has come to our attention that there are some native cacti growing in the area to be spanned by the proposed Kaiparowits transmission lines; namely small globular cacti of the genus *Pediocactus*. Some of these cacti are listed in the Smithsonian Institution's Report of the National Academy of Sciences, Species of the United States, House Document No. 91-511, Serial No. 91-4. We were quite shocked to learn that the Kaiparowits Draft, vol. III, pp. 117-118, lists three *Pediocactus* thought to be located along the transmission line route. These are: *Pediocactus* (Tommyoa) *pygmaeus*, *P. (Tommyoa) peeblesianus*, and *P. parvideni*. The Smithsonian Report (p. 511) lists *P. peeblesianus* as endangered with *P. pygmaeus* and *P. parvideni* as threatened. In regard to the Smithsonian Report, mapping of the ranges of listed species is only just beginning. The limited information on the species situation exists in regard to the three taxa of *Pediocactus* and that their range be precisely mapped before final approval of the proposed Kaiparowits transmission line route.

We also urge that the compilers of the Kaiparowits Draft be exhorted to conduct a vegetation survey of the proposed Kaiparowits power plant site and all proposed transmission line routes and their alternates. We would like to see the vegetation study conducted on the same level as the wildlife study; i.e., giving special attention to species thought to be threatened or endangered, and detailing their distribution on maps.

inadequacies of the vegetation surveys can be seen in the following excerpts from the Draft:

vol. I, p. 167:

vol. 1, 1967, "The remainder of proposed route between Las Vegas and El Dorado Substation, a typical creosote-burrobush association prevails. Thornbush, gray Krameria, yucca and many species of cactus are common to this association." Taxa should be listed by their latin binomials as common names could refer to any number of closely related species. Only then can such taxa be checked with the Smithsonian Report in order to determine their status. Also the cacti need to be identified down to genus, species, and variety in order to properly evaluate their status.

vol. II, p. 173, section entitled "Rare and Endangered Species" to summarize, this page lists only the plants protected by Arizona state law and is not specific as to whether or not these protected species occur on the proposed transmission line route. The list does not acknowledge to the existence of the Smithsonian Report and the many threatened and endangered species which may be located within the boundaries of the Kaiparowits project. The Report should be consulted and its recommendations followed.

vol. II, p. 17h: "An intensive vegetative study of the total route has not been made." because of the critical situation which may exist with certain cacti, it is imperative that a more intensive vegetative study be made and that it be published with distribution maps in the environmental impact statement. There are other endangered species listed in the report which are not included in the draft. These are: *O.E.*, threatened *Cactaceae* indigenous to the affected areas, listed in the Draft of the *Piedicactus gileri*, an endangered species, *Piedicactus gileri* in Pipe Springs National Monument and *Naiabes* growing in close proximity to the proposed transmission lines. One species, *Echinocactus keranthemoides*, which grows in southern Utah, is not listed in the Report, should be mapped. The following species distribution should be noted: *S. wislizeni* from the report as threatened and *S. elaeagnifolius* should be noted: *S. wislizeni* from Nevada, *S. elaeagnifolius* native to Utah and Arizona; and *S. pubispinus* from Nevada. *Sclerocactus plumbeus* is an endangered species, but it may occur only farther east from the Kaiparowits routes.

vol. II, p. 175, fig. 35: presents a list compiled by the California Native Plant Society of endangered and rare species "...which occur within the vicinity of the proposed powerline system." (II, 17h). How the powerlines will affect such taxa as *Coryphantha vivipara* var. *alversconii* and *Dudleya saxosa* var. *aloides*, is not discussed, nor are any distribution maps presented. Fieldwork is needed here.

vol. II, pp. 196-199, illustrations 22-24, show maps of ranges of endangered wildlife. There is no comparable map illustrating the ranges of endangered flora.

vol. III, p. 139:

vol.III, p. 139:
 "Unique vegetation on the Kaiparowits Plateau (very old piñon and juniper trees)...The impact from loss of this unique vegetation could be great." There is no mention of cacti growing in this area, which could well contain species of Echinocereus, and Pediocactus simpsoni var. minor. A complete report of the Kaiparowits Plateau vegetation should be submitted and published in the impact statement.

vol. III, pp. 147-148:

vol. III, pp. 147-148:

"The following protected plants either occur or are likely to occur along the proposed route in Arizona: *Nashingtonia filiformis* (an palm), *Lycium*, *thornberi* (ornamental tree), *Bursera* *flavescens* (elephant tree), *Cercus schottii* (senita or "old one"), *Cercus* *albermariae* (organ pipe cactus), *Toumeyia yuccacantha* (*toumeyia*), *Toumeyia* *gambelii* (*toumeyia*), *Noeuvania diguetii* (*dahila* cactus), *Fedickia purpurea* (*pedicularis*).^a Since these are important plants, it is recommended that their ranges be mapped to find if they truly do occur along the proposed route. If a significant portion of their range lies to the west of the Kaiparowits project, then alternate proposals for location of powerlines, access roads, haulage roads, and facility sites should be submitted.

It is hoped that further field work be done in order to map all vegetative communities, with special emphasis given to those listed in the Smithsonian Report as endangered or threatened. If significant portions of habitats for endangered and threatened species are to be disturbed by proposed transmission lines, access roads, etc., then alternate proposals for such lines should be given consideration in order that such habitats will not be disturbed. We also hope that your office will give consideration to advising compilers of the Kasperovits Draft to print distribution of maps of all vegetation, or at least those listed in the Smithsonian Report, and that they will refer to the various taxa by their latin binomials and only to include the common name(s) in parentheses.

Please give this matter your consideration.

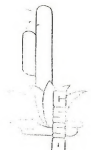
Sincerely,

Gary Lyons
 Gary Lyons, Chairman, Conservation Committee of the Cactus and
 Succulent Society of America.

c/o
 Huntington Botanical Gardens
 1151 Oxford Rd.
 San Marino, Ca. 91108
 213-792-6141

IX-538

THE CACTUS & SUCCULENT SOCIETY OF AMERICA



State Director
 Southwestern
 Bureau of Land
 Management
 Salt Lake City

Dear Sir:

On behalf of the Cactus and Succulent Society of America, I wish to express concern regarding some aspects of the Kasperovits Environmental Impact Statement Draft.

The vegetation data, p. 174 in Vol. II, fails to mention what species of cactaceae and graminaceae will be disturbed in Arizona because of the transmission lines. Also, we feel that there should be survey of vegetation that will be eliminated by construction of the powerplant and surrounding complexes.

The Draft should include detailed vegetation maps, not just dominant vegetation distributions, showing exactly where the endangered species are that lie in the way of the powerlines.

Methods of rescuing threatened and endangered species from destruction should be researched and included in the Draft, but preferably, alternate routes should be sought.

It is alarming to note that Thurberia parryana (III-147), T. pusilliflora (III-148), and Artemisia tridentata (Ibid.) are located along the transmission line route. The Smithsonian Report on Endangered and Threatened Species of the United States (House Document No. 91-31, Serial No. 91-2) lists these species as threatened and endangered. Survey work on the distributions of species listed in the Smithsonian Report will begin in the near future and implementation of the proposed powerline routes should be contingent upon completion of survey work of threatened and endangered species to be affected by the Kasperovits project. If such species cannot be protected, then the Cactus and Succulent Society could organize a rescue operation of cactaceae, transplanting them to other localities out of the way of the powerlines and access roads and/or in to cultivation.

With proposed powerlines extending from Fredonia, along the southern border of the Naibab Indian Reservation, we would like to know if Pediocactus sileri is reported in the vegetation surveys. This species is endangered and is of very limited distribution, endemic only in the above mentioned areas. This species must be pin-pointed in relation to the proposed powerlines.

Sincerely yours,

Gary Lyons
 Gary Lyons, Chairman, C-S-S-A. Conservation Committee.



Rocky Mountain Federation
of
Mineralogical Societies

65

RECREATIONAL USE OF THE PUBLIC LANDS
Rocky Mountain Federation Advisory Committee

ADDENDA TO REPORT OF
ELSIE S. MATTHEWS, on behalf of the Rocky Mt Federation of
Mineralogical Societies on the Kaiparowits Project in Southern
Utah.

I *heartily* agree with the sentiments of Jack W.
Carlson, Assistant Interior Secretary for Energy and Minerals,
to the American Mining Congress as reported in the CONSERVATION
REPORT OF THE NATIONAL WILDLIFE FEDERATION, 1412 Sixteenth Street,
N.W. Washington D.C. 20036.

Mr. Carlson said " lamenting the fact that large
areas of the country like the National Parks and Wilderness
Areas were closed to mining and energy production at a time
when there is increasing scarcity of a number of critical
materials."

In reply Assistant Secretary Reed said that the
above sentiments were those of Mr. Carlson and did not
represent the thinking of the department. He went on to
say that although underground mining might not hurt the en-
vironment, that these views had been thoroughly discussed and
he could "categorically say that the National Park System
was not going to be subject to more mineral production."

I have also read in many and various media multi-business
outcries against "polluting" "our environment, desecrating
fragile terrain, and endangering animals and artifacts.

I think the whole thing boils down to the question
"Do we want to protect remote areas where if coal mining, oil
and gas exploration and implementation, and where if enough
emphasis is placed on such "ideals" little children, babies,
old people, would have to suffer cold and perhaps hunger,
and business and manufacture alter, or whether the relevant
departments should use common sense and not be hindered by
mostly uninformed "do-gooders".

Perhaps the fair thing to do would be to put the
question before the electorate in the next election, in some
such form as the following.

Do you want coal mining, oil and gas production,
and timber cutting prohibited in all lands federally owned or
administered or do you want to be able to have coal, gas, oil
and electrical energy for your and other use?

Submitted by

Elsie S. Matthews

CHAIRMAN
Federation of Societies
1. 1000
Lands
Fed. Min.

MS. E. S. MATTHEWS
926 SANDSTONE
BARTLESVILLE OK 74003

IX-539



IN REPLY
REFER TO: 610

651.-

United States Department of the Interior

BUREAU OF RECLAMATION
WASHINGTON, D.C. 20240

66

66

Mr. Paul L. Howard
State Director, Bureau of
Land Management
Department of the Interior
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

We have reviewed the draft environmental statement on the proposed Kaiparowits Project, DES 75/43, as requested by your letter dated July 29, 1975.

The following comments are offered for your consideration:

Chapter I, Description of Proposed Action: We believe the section on the need for the power and energy could be improved. The historic relationship of electric power and energy consumption to economic stability, employment, and gross national product should be briefly discussed. The importance to the Nation of utilizing internal coal resources, as opposed to foreign oil, should be discussed.

Page I-157: As a supplement to the narrative description in the draft statement, it would be helpful if the proposed routes shown on illustration 38, which is a key map of the transmission system, were identified by voltage class, title, number of lines, and ownership. A legend would be helpful in showing some of that information.

Page I-183: The proposed Kaiparowits-Navajo route is not clear on that map.

Page I-230: Under the heading "Towers, conductors and footings," there should be a discussion on the type of conductors which will be used in the line, particularly with regard to whether the conductors will be a nonspecular type or not.

OCT 17 1975

Page I-345: Fourteen projects are listed which may or may not have a cumulative impact on air quality. It is stated that "cumulative impacts, if any, will be specifically set out in subsequent parts of the statement." Cumulative impacts on air quality are not mentioned in the summary sheet, nor did we find any significant coverage in the remainder of the statement.

Page I-353, third paragraph, fourth sentence: Diversion points for the Sanpete Project are in the drainage of Cottonwood Creek, a tributary of the San Rafael River, not in the Price River drainage.

Page I-355, third line: The report states that the Uintah Unit of the Central Utah Project has been given "conditional" authorization. That may have been true when the report was written; however, the "conditional" term should be removed since the Uintah Unit is now in an authorized status.

Page I-356, second paragraph: Delete the last sentence and substitute "The Uintah Unit was authorized by the Congress pending certification by the Secretary of the Interior. The Secretary of the Interior signed the Certification Report on August 21, 1975, for submission to the President and the Congress."

Chapter III, Environmental Impacts of Proposed Action: There is no discussion or analysis on the emergency control of accidental oil spills at the powerplants or switchyards. Section 301 of Public Law 92-500 requires the preparation of a spill prevention control and countermeasure plan for prevention and control of oil spills.

There is no discussion or analysis on the relationship between the Safe Drinking Water Act of 1974, the regulations for drinking water standards, and the quality of the water pumped as a supply for the new town. Does the 750 milligrams per liter (total dissolved solids) meet drinking water standards? Do individual mineral constituents exceed standards?

Chapter IV, Mitigating Measures, pages IV-87 and -88: The transmission line construction will necessitate removal of plants protected under the Arizona Native Plant Act (Arizona Revised Statutes, Section 3-901, et sequentes, 1972). The protected plants can be removed for transplanting through cooperation with the Arizona Agricultural and Horticultural Commission. The Commission should be contacted and a mitigation program for protected plants undertaken by transplanting. A similar arrangement could be made with the State of California.

IX-540



Chapter VIII, Alternatives to the Proposed Action, page VIII-200, Figure 8: The figure gives the height of the 600-kV d.c. towers as 140 feet. We understand that the height would be about 165 feet. Figure 8 gives the height of the 765-kV a.c. towers as 140 feet. We understand that the height would be about 162 feet. Figure 8 indicates the 600-kV d.c. line routing to be from Kaiparowits to Serrano via Moenkopi and Devers. We understand this d.c. line routing, as now planned, would be from Kaiparowits to Mesa (near Roscovead) via Eldorado.

Pages VIII-200 and -201 - (Single-Circuit 600 kV d.c.): As implied in the comment immediately above, the d.c. line routing should be changed. Also, the report should include discussions of the costs and reliability of the single-line d.c. system as compared to the two-line 500 kV a.c. system. It is understood that the investment cost of the single-line d.c. is less, the present worth of the future yearly costs including cost of losses is more, and the reliability is less than the two-line 500 kV a.c.

Page VIII-201 - (Single-Circuit 765 kV a.c.): The comment is similar to the comment above on the single-circuit 600-kV d.c. system. The costs and reliability considerations, as compared to the two-line 500-kV a.c. system, should be included for the single-circuit 765-kV a.c. system. We understand that the costs of the latter system are less and the reliability is less; the decrease in reliability is such as to make the system unacceptable.

Page VIII-201 - (Double-Circuit 600 kV d.c. and Double-Circuit 765 kV a.c.): The report should indicate that although the reliability of such systems would be adequate, the costs would be prohibitive.

Page VIII-375: The last paragraph on that page concerns a discussion of "Alternative uses of water and coal." The discussion and Figure 23 on page VIII-376 are limited to the Lake Powell area. We feel that section should be broadened to include the entire Colorado River Basin in Utah, particularly with respect to water uses and water rights. In December 1974, the Utah State Engineer published "An Inventory of Water Rights, Upper Colorado River Basin, Utah," which includes many more applications for energy-related projects than are listed in Figure 23. All of that water use will fall within Utah's allotment of Colorado River water.

Reference Material, page A-136: It is stated "If the availability of water in the Southwest is the limiting factor in the production of energy resources, a net energy gain could be realized if Kaiparowits water from the Colorado River were shifted to use in oil shale production." Since water supply may be a limiting factor in future developments, we suggest the statement regarding alternative use of water be discussed at greater length in the alternatives section of the environmental statement.

Page A-168, last line of paragraph II C: Before the words "Kaiparowits Power Project," add "ultimate phase of the Central Utah Project and for use in connection with the."

Page A-168, last line of paragraph II D: Insert the word "into" between "enter" and "the."

Pages A-545 and -553 and Corresponding Reptile Narrative in Chapter II: The narrative in chapter II and tables on pages A-545 and -553 appear to represent a less than adequate analysis of the reptile and amphibian fauna native to the subject areas. Subspecies, unique in the world and found in that area, are not adequately described. The impacts to those unique animals are not adequately addressed.

We hope these comments will be constructive toward the preparation of your final environmental statement.

Sincerely yours,



Commissioner

cc: Director, Bureau of Land Management

U-5-XI

UNITED STATES GOVERNMENT

Memorandum

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

67

IN REPLY REFER TO:

N-10708
(N-911.3)



STATE OF NEVADA
OFFICE OF THE STATE PLANNING COORDINATOR
CAPITOL COMPLEX
CARSON CITY, NEVADA 89701
(702) 689-6065

67

TO : State Director, Utah

Date:

FROM : State Director, Nevada

SUBJECT: Comments on Summary Draft of Kaiparowits EIS
Dated January 1975

The enclosed comments were received on the subject summary draft from the State of Nevada Division of Colorado Resources and the Nevada State Clearinghouse. The comments are submitted for your information and records. A copy has also been sent to Mike Johnson, Arizona State Office.

Mr. E. I. Rowland
Bureau of Land Management
Nevada State Office
Room 3008 Federal Building
300 Booth Street
Reno, Nevada 89502

RE: KAIPAROWITS ENVIRONMENTAL IMPACT STATEMENT
SAI # NV 75800015

Dear Mr. Rowland:

Attached you will find comments from Land Use Planning on the above referenced Environmental Impact Statement. There will be additional comments from the Colorado River Commission.

These comments constitute the State Clearinghouse review of this proposal, and we would appreciate it if you would incorporate them in your final Environmental Impact Statement.

Sincerely yours,

Bruce D. Artell
State Planning Coordinator

BDA:hw
enc.

cc: Land Use Planning
Colorado River Commission

Enclosures - 2

Encl. 1 - Ltr dtd 3/19/75

Encl. 2 - Ltr dtd 3/25/75

IX-542



ADMINISTRATIVE
DIVISION OF STATE LANDS
NOT RECORDED
RECORDS SECTION
TELEPHONE 245-4151

67

STATE OF NEVADA

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

Office of Land Management

Division of State Lands

CARSON CITY, NEVADA 89701

10000
A. 10. MAR 24 1975

NEVADA STATE OFFICE
CARSON, NEVADA

February 25, 1975



MEMORANDUM

TO: Bruce Arkell

FROM: John Meder *JM*

RE: Kaiparowits Environmental Impact Statement Summary

We are most interested in two aspects of this project - the transmission system routing and the generated energy.

Transmission System Routing

This summary FIS is inadequate for us to assess either the proposed routing or the various alternatives. Detailed maps should have accompanied all significant items discussed in the text.

The routing system shown on page 8 is about the best description provided of the proposal. Elsewhere (page 26) there are vague references - "in western California, Las Vegas and Bull Head City, the proposed transmission line would impact areas currently zoned for residential use."

The alternative routes discussed are not shown on any maps. Number 8 on page 44, for example, states that, "This alternate would avoid subdivided areas and would not be visible from Henderson, Nevada, however, it crosses the Eldorado Valley airport study area."

Without better descriptions (both written and mapped) of the proposed transmission system and the alternatives, we are unable to make any specific comments at this time. It is our hope that the impacted jurisdictions in Clark County have more complete information with which to work.

Generated Energy

According to the FIS, only California and Arizona will receive energy generated at the Kaiparowits Project. What are the benefits to be derived by the State of Nevada that would offset the adverse impacts? Perhaps some arrangements could be made so that the Las Vegas area could tap into this energy supply in the event of an emergency or in the future.



STATE OF NEVADA

OFFICE OF THE STATE PLANNING COORDINATOR

CARSON, NEVADA

J. CARSON CITY, NEVADA 89701

(702) 338-5929

March 25, 1975

Mr. B. I. Rowland
Bureau of Land Management
Nevada State Office
Room 3003 Federal Building
300 Booth Street
Reno, Nevada 89502

RE: KAIPAROWITS ENVIRONMENTAL IMPACT STATEMENT
SAI # NW 75800015

Dear Mr. Rowland:

Attached you will find additional comments on the above mentioned FIS from the Division of Colorado River Resources.

We would appreciate it if you would incorporate them in your final Environmental Impact Statement.

Sincerely yours,

Bruce D. Arkell

Bruce D. Arkell
State Planning Coordinator

cc: Mr. D. Poff

67

IX-543



MIKE O'CALLAGHAN
GOVERNOR

STATE OF NEVADA
DIVISION OF
COLORADO RIVER RESOURCES

P.O. Box 1748
LAS VEGAS, NEVADA 89101

TELEPHONE (702) 739-6490

March 21, 1975

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DONALD L. PAPP
Administrator



67

Memo to State Planning Coordinator March 21, 1975
Re Kaiparowits Environmental Impact Statement Page 2

Memorandum

To: Bruce D. Arkell, State Planning Coordinator,
Governor's Office

From: Administrator, Division of Colorado River
Resources

Subject: Draft Kaiparowits Environmental Impact Statement
Summary dated January 1975

We regret our delay in forwarding our comments regarding the above subject. Overall, we believe that there is a need for additional coal-fired electrical generation in the Western States and that the proposed Kaiparowits plant fulfills a portion of that need. Nevada is not a direct beneficiary of that power and energy to be produced; however, the additional capability has a potential benefit to Nevada and to the Southwest region area in that it adds an additional potential backup source to the interconnected system.

We feel that the Summary does not include the following elements as identified below:

1. The identifiable and measurable water quality impacts of withdrawing 99 thousand acre feet of Colorado River water from Lake Powell. (Page 12)
2. Quantification of the cooling tower drift salt potential and stack emission contribution of chemical components to Lake Powell.
3. Definition of quantities of Colorado River water vs. in situ State groundwater to be distributed or consumed.
4. Identification of handling (disposal) of plant blowing down water.
5. Better definition of the local economy now and in the future. What is meant by seasonal and what is anticipated in the future? (page 670)

6. The alternative transmission systems should be displayed on a map that can be read. All maps included in the Summary are essentially unreadable.
7. Specific requirements of interstate water quality requirements are not outlined in the Water Quality Amendment P.L. 92-500 which totally amended the Federal Water Pollution Control Act. Some specific requirements have been developed but not the full spectrum of requirements that may be applicable to plant and appurtenant elements. (Page 625)

Because of the extremely superficial treatment of many important aspects of the project, we request a copy of the complete report be made available to us. To confirm this request we are returning the Report to the Department for a with the indication of additional information required.

Handwritten signature
Donald L. Papp

cc: Mr. O. Hall, Assistant Director
Conservation & Natural Resources

101 S. 1st St.
C. 8970

BOARD OF SUPERVISORS

James L. Mayfield First District
 Daniel D. Mikesell Second District
 Susan Rosenberg Third District
 Robert O. Townsend Fourth District
 Nancy L. Smith Fifth District



Robert O. Townsend

County Civic Building
 175 West Fifth Street
 San Bernardino, California 92415
 Telephone: (714) 383-1518

68

Robert A. Covington
 Administrative Officer

Leona Rapoport
 Clerk of the Board

October 29, 1975

Mr. Paul L. Howard
 Utah State Director
 Bureau of Land Management
 125 South State Street
 Salt Lake City, Utah 84111

Re: Draft Kaiparowits Environmental Impact Statement

By action taken on October 27, 1975, the Board of Supervisors adopted the enclosed resolution indicating its comments on the EIS.

I am also enclosing a copy of the report prepared by the Environmental Improvement Agency in connection with the project.

BOARD OF SUPERVISORS OF
 SAN BERNARDINO COUNTY

Leona Rapoport
 Clerk of the Board

LR/cc

encl

MINUTES OF THE BOARD OF SUPERVISORS
 OF SAN BERNARDINO COUNTY, CALIFORNIA

68

On motion by Supervisor Mayfield, duly seconded by Supervisor Mikesell and carried, the following resolution is adopted:

RESOLUTION SR-75-136

WHEREAS, the Bureau of Land Management has asked the Board of Supervisors to comment on the Draft Environmental Impact Statement for the proposed Kaiparowits Project, and

WHEREAS, the County of San Bernardino is presently involved in preparing a major energy facility siting study known as the Joint Utilities Management Plan, and

WHEREAS, the findings of the Joint Utilities Management Plan will, upon completion in early 1976, make an important contribution to the Draft EIS for the proposed Kaiparowits Project.

NOW, THEREFORE BE IT RESOLVED that the Board of Supervisors of the County of San Bernardino, State of California, hereby makes the following comments:

- (a) That the final EIS reflect the findings of the Joint Utilities Management Plan which will be forwarded to the Bureau of Land Management upon completion in early 1976;
- (b) That serious consideration be given to energy conservation and alternative methods and sources of power generation before proceeding with the proposed Kaiparowits Project;
- (c) That a potentially more environmentally acceptable regional direct current transmission system should be given careful consideration as an alternative for the proposed 500/KV/ac system;
- (d) That if it is deemed necessary to proceed with the proposed Kaiparowits Project, the Board of Supervisors strongly recommends the BLM Ward Valley Alternate Route due to its minimal adverse impact;
- (e) That the other routes (Bristol Mountains, Sheephole and Ward Valley East alternatives and Ward Valley preferred) are opposed due to all requiring creation of many miles of additional corridor as well as adversely impacting areas of high natural, recreational, scenic and economic values.

BE IT FURTHER RESOLVED that this resolution be noted in the minutes of this Board and a copy hereof forwarded to the Bureau of Land Management.

PASSED AND ADOPTED by the Board of Supervisor of the County of San Bernardino, State of California, by the following vote:

AYES: SUPERVISORS: Mayfield, Mikesell, Townsend, Hansberger

NOES: SUPERVISORS: None

ABSENT: SUPERVISORS: Seith

STATE OF CALIFORNIA

COUNTY OF SAN BERNARDINO

I, LEONA RAPOPORT, Clerk of the Board of Supervisors of San Bernardino County, California, hereby certify the foregoing to be a full, true and correct copy of the record of the action taken by said Board of Supervisors, by vote of the members thereof, on the 27th day of October, 1975, in the District Offices of said Board at the following date:

October 27, 1975
 Given: 10/29/75
 Planning Director Kenneth Topping
 Environmental Improvement Agency Administrator
 Mr. Paul L. Howard - BLM

LEONA RAPOPORT

Clerk of said Board.

File

10/29/75

Leona Rapoport
 Clerk

REPORT ON
KAIPAROWITS ENVIRONMENTAL IMPACT STATEMENT
October 23, 1975

The Bureau of Land Management, Department of Interior, Utah State Office, has asked the Board of Supervisors to comment on the Draft Kaiparowits Environmental Impact Statement (EIS). San Bernardino County is affected because of alternative transmission lines which may traverse the desert areas of the county.

The Draft EIS has been considered by the Planning Department, the Environmental Analysis Division, and other affected departments in light of the information which they have and from the point of view of the constraints and community concerns developed in the preliminary meetings of the Joint Utilities Management Program (JUMP). The recommended comments are as follows:

1. During the last year, the County Planning Department has been intensely involved in preparing a comprehensive, Countywide Joint Utilities Management Plan (JUMP). This study addresses county policy on facility siting, energy conservation and development of alternate energy sources. In addition, technical constraint maps for facility siting are being prepared to initially screen out all environmentally nonsupportive land. This study is in its final phase and should be ready for hearings by the first of the year.

The whole purpose of this study is to allow individual facility siting decisions to be made within the context of an overall management plan. The Federal and State EIS states on page II-8 as follows: "The county zoning and plan are not specific in the laying of the transmission lines. No master or land use plan has been done for much of this area." This study will address itself to that problem, and the County of San Bernardino requests that the final EIS reflect the findings of our soon-to-be completed JUMP, which will be sent as soon as adopted by the Board of Supervisors.

Existing utility proposals include a 500 megawatt fossil fuel unit as an extension of the existing plant east of Barstow, a 1500 fossil fuel plant east of Lucerne Valley, a 1500 to 3000 megawatt nuclear plant in the eastern Mojave Desert, and at least eight transmission systems from existing corridors to traverse the county area. Therefore an overall management plan for the 20,000 square miles of the county is greatly needed. It would seem appropriate that the Bureau of Land Management consider the total regional aspects of utility siting problems for the entire southwest area of the United States.

2. Since the need for the Kaiparowits Project has been based upon the projection of historic electrical demand growth rates of 6% or greater, the need for such a facility should be carefully reassessed. Current projections indicate that these growth rates may well be unrealistic for the future.

KAIPAROWITS ENVIRONMENTAL IMPACT STATEMENT
PAGE 2 of 3

2. (Continued)

The JUMP emphasizes that we must first give serious consideration to energy conservation and alternative methods and sources of power generation.

3. Development of the proposed 500 kilovolt/ac transmission system would preclude future consideration of a potentially more environmentally acceptable southwestern direct current system. A single circuit 600 kilovolt/dc system consisting of tall, thin towers would contribute to less right-of-way width and less total visual impact. A regional direct current system should be given serious consideration before proceeding with plans to construct a 500 kilovolt/ac system.
4. The JUMP technical constraint maps are a composite statement of 21 different variables. Each variable is regional in nature and necessarily deals with only those information issues that could be quantified. Critical community issues such as health, views and economic impacts are not reflected in these support maps. Therefore, the following comments on each route reflect both the regional technical constraints and more specific area information.

Route One (Bristol Mountain). This alternative route would traverse areas of high natural, recreational and scenic values and would involve the creation of 58 additional miles of corridor.

This alternative is not supported.

Route Two (Sheephole). This alternative would severely impact the communities between Twentynine Palms and Morongo Valley. 125 miles in length. This route would have the greatest adverse impact of all routes considered. High voltage transmission lines crossing through this relatively narrow valley would adversely affect the desert scene, recreation potential and economic growth options in this area.

The most heavily used entrances to Joshua Tree National Monument are at the communities of Twentynine Palms and Joshua Tree. In addition, the Twentynine Palms Highway has been designated as a Scenic Highway in the Scenic Routes Element of the County General Plan.

Finally, there has been strong local opposition to this route corridor since the early 1950's.

This route is strongly opposed.

Route Four (Ward Valley East). This alternative has the potential of adversely impacting a proposed natural area in the Sacramento Mountains, as well as creating 99 miles of new corridor. This route is not supported.

KAIPAROWITS ENVIRONMENTAL IMPACT STATEMENT
PAGE 3 OF 3

Route Three (Ward Valley). This alternative would require fifteen miles of new corridor. A slight variation of this route is proposed by the Bureau of Land Management which would totally follow existing corridors. Of the proposed routes, the BLM Ward Valley Alternate Route would have the least adverse impact.

This route is strongly recommended.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
WASHINGTON, D.C. 20240

ADDRESS ONLY THE DIRECTOR,
FISH AND WILDLIFE SERVICE

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69

OCT 30 1975

MEMORANDUM

To: State Director, BLM,
Utah State Office
Salt Lake City, Utah
Deputy Associate
From: Director, Fish and Wildlife Service
Washington, D. C.
Subject: Draft Environmental Impact Statement—Proposed Kaiparowits
Project, Utah.

Responsive to your July 29 request, we have reviewed the subject
draft statement and offer the following comments:

General EIS Comments: The draft EIS is comprehensive and fairly well
organized. It is comparatively easy to find pertinent sections on
specific impacts. But, it is also voluminous and contains far too
much repetition. In section after section, material is repeated
almost verbatim from chapter to chapter. Readability would be greatly
improved if the data were condensed and repetition reduced.

Discussions of long-term adverse impacts on fishes, wildlife, and the
environment are scattered throughout the sections and often appear
conservative and contain too little consideration of cumulative
effects. Chapter III-8, Paragraph 6, estimates that salt accumulation
on 1,375 acres would result in an estimated loss of 20 deer. One
hundred and forty-four pages later, Chapter III-152, Paragraph 1,
we find the powerplant would permanently occupy 930 acres, resulting
in a loss of an additional 30 deer. In another section, we find that
the new town will wipe out the only antelope herd in the area. Another
section contains the possibility that mercury emissions will severely
impact the already mercury-contaminated sport fishery in Lake Powell.

There are similar data scattered throughout the various chapters. It
would be helpful if these data were brought together in a comprehensive
summary impact statement. Nevertheless, the present EIS represents
a massive amount of work fairly well depicting impacts.

General Air Quality Comments: Chapter I-6, Paragraph 1: Emission
controls on the stack will be designed to remove 99.5 percent of the
particulate matter and 90 percent of the SO₂ (sulphur dioxide). At peak
efficiency, an estimated 12.2 tons of fly ash, 34.3 tons of SO₂ and
250 tons of NO_x (nitrogen oxide) would pass through the removal systems
each day into the atmosphere. Experience shows that over a long-term
period a well-designed and well-maintained system will average less
than 99.5 percent or 97 percent of its rated efficiency. If this
is accurate, we could expect the average emission of particulates to
increase to 73.2 tons per day with corresponding increases in emissions
of sulphur dioxide. In addition, Chapter II-37, Figure 2, lists
trace elements that are expected to be in the stack emissions. The
list includes mercury, arsenic, lead, cadmium, beryllium, fluorine,
selenium, and some radioactive nuclides, all of which are toxic to
living organisms including man. Most of these are fairly stable and
tend to accumulate in the environment. The accumulative effects of
the materials in this semi-arid climate need to be evaluated. The
movement of these materials through the various biological systems
should be defined, especially where trace materials are concentrated
by living organisms.

Chapter III-78, Paragraph 4: The assumption that most trace elements
would be deposited uniformly in a 30-mile radius of the stacks is not
warranted. Prevailing winds are northeasterly (Chapter II-47, Para-
graph 1). Some emission elements would drop out of the air column
sooner than others, resulting in heavier concentration in the vicinity
of the plant and in a northeasterly direction from the plant. Sulphates
and nitrogen oxides can be carried great distances under the right
conditions.

Chapter III-3, Paragraph 2: Reduction in visibility from plume
opacity is estimated at a maximum of 11 percent. This assumes that
the emission control equipment will function at maximum rated efficiency.
This should probably be figured at a long-term efficiency average.
Airborne dust from mines, quarries, and unsurfaced roads should be
added to the estimate. Also, there are other existing and proposed
plants in the vicinity that will have an accumulative detrimental
effect on the air quality and visibility of the area. This is particu-
larly noteworthy when one considers that there are several National
parks, monuments, and recreation areas within a 100-mile radius of the
Kaiparowits Plant.



Chapter I-306-312 details employment projections in the Kane-Garfield, Utah Counties and Page, Arizona, area and plans for the development of the new town associated with the Kaiparowits project. The project will bring in an estimated 14,000 to 15,000 new residents, roughly tripling the population of the area. Plans should also be included to mitigate the socio-economic impact on these people and the States of Utah and Arizona when powerplant operations cease in the not-too-distant future (35 to 40 years), and they are surrounded by a degraded environment.

General Transmission Lines Comments: The requirement of biological expertise detailed in Chapter IV-68, Item 22, is extremely commendable. As discussed in our specific comments, however, we believe an aquatic biologist should be added to the team.

With few exceptions, which will be discussed under specific comments, known transmission line impacts have been properly displayed. However, a general problem exists which in recent years has become more prevalent among multi-disciplined, right-of-way granting agencies in relation to the alignment of transmission lines. The problem is inherent in Item No. 41, Chapter IV-76, which states: "Grantee would at all times locate transmission and communication facilities to take advantage of natural topography and vegetation to screen structures from public recreation areas and highways." This "out-of-sight, out-of-mind" policy has led to the placement of transmission lines and access roads in good wildlife producing back country rather than along existing transportation corridors where habitat has already been severely disturbed. Since much of our good wildlife land does not have official designation by local, State, or Federal Governments, it is being sacrificed in the interest of maintaining scenic quality.

We believe this problem has been compounded by guidelines detailed in Environmental Criteria for Electric Transmission Systems, a 1970 joint publication of the Departments of Interior and Agriculture. The major theme of this publication is to design and build transmission lines with as little visible impact along highways as possible. This often results in placement of transmission lines in the back country with needless destruction of valuable wildlife habitat.

Alignment of the proposed Kaiparowits-Phoenix transmission line is a specific example of this general problem. The proposed transmission line route would pass through good wildlife habitat from the northern boundary of the Kaibab National Forest ten miles northwest of Williams south to New River, a distance of about 100 miles along the alignment.

Several likely alternatives exist to the west of the mountains and mesas of the proposed alignment. We know that during the early stages of drafting the EIS, Bureau of Land Management was working with alternative routes further west in Chino Valley. We believe these routes should be discussed in the EIS. One alternative not considered for the Kaiparowits-Phoenix route in the early stages paralleled the proposed Kaiparowits-Moenkopi-Mohave transmission line route west as far as Chino Valley and then turned south through Chino Valley. Another alternative not considered is to follow the existing route to Highway 66 and then follow the highway east to Chino Valley and turn south through the valley. South of Chino Valley, by far the least destructive alternative route for wildlife would parallel immediately adjacent to the west side of Interstate 17 from Cordes Junction south to New River. This alternative should also be discussed in the EIS. The existing twin 500 KV Navajo Transmission Lines parallel 2000 feet from the proposed Kaiparowits-Phoenix route, and they have had excessive adverse impacts on mule deer and antelope herds on Sycamore, Perry's, and Black Mesas and cross critical antelope, deer, and elk wintering range north and south of Highway 66 near Williams. Another 500 KV powerline 2000 feet away from the existing 500 KV powerlines, as proposed, would only add to the burden on wildlife. The 2000-foot separation would require building as much new access road as was required for building the Navajo Lines. Our biological assessment, more in hindsight than original good planning of transmission line corridors, indicates that alignment of the Navajo Lines was a mistake, and we would not like to see the existing Navajo Lines right-of-way expanded.

Since the proposed transmission line routes could in several cases increase access into prime wildlife areas thus having adverse impacts on these resources, we believe it appropriate that BLM arrange a meeting with concerned parties to discuss corridors for powerlines that would be acceptable from a wildlife management viewpoint. Such a meeting would benefit all parties and may alleviate most of the problems surfaced in our review of the draft statement.

Specific section by section comments on the draft statement are attached.

W. J. Alder Jr.

Attachments

DRAFT ENVIRONMENTAL IMPACT STATEMENT
PROPOSED KAAPAROMTIS PROJECT, UTAH
SPECIFIC SECTION-BY-SECTION COMMENTS

Chapter I-11, Paragraphs 3-5: About 1,600,000 cubic yards of aggregate material will be needed for construction purposes. About 200,000 cubic yards will come from Upper Wahweap Creek. The rest will be taken apparently opportunistically from undesignated sites. This has the potential to severely damage many undesignated streams along the roads and transmission line routes. All aggregate sites should be identified and controlled. No aggregate should be taken from Peria or any perennial streams unless absolutely necessary, and where necessary, the impacts should be identified in the statement.

Chapter I-59, Paragraph 1: The kind of "non-toxic" chemical dust suppressant suggested as a substitute for water at coal sites should be identified.

Chapter I-84, Paragraph 1: One foot of earth cover over the ash and sulphate fill area seems inadequate for revegetation. Certainly no trees or deeply rooted plants will likely grow there again. Since plants, in the event they do survive on this harsh site, will contain toxic elements from the waste materials, the area should probably be fenced to prevent browsing by native and domestic animals.

Chapter I-89, Paragraph 2 and Illustration 18: The deep water-intake pipe would virtually be impossible to effectively screen to prevent fish losses, and they will likely occur.

Chapter I-115, Paragraphs 1-2: Water-monitoring plans should be detailed as to what will be monitored and at which sites.

Chapter I-240, Paragraph 4: This paragraph says that new access roads would be constructed along the transmission line right-of-way when suitable existing roads were not available. It would help if maps were provided showing where new access roads will be built. We cannot assess the impacts of at least several hundred miles of new access roads without knowing where they will be.

Chapter I-243, Paragraph 2; Chapter I-299, Paragraph 4; and Chapter I-301, Paragraph 3: These paragraphs combined indicate that access roads for the southern transmission system in Arizona will be closed and obliterated after construction, and patrolling for maintenance purposes would be by air. However, access roads for the western transmission system will be bladed annually and maintenance patrolling of the powerlines will be by ground vehicle on these roads. We question why it is feasible for the

southern system applicants, Arizona Public Service and Salt River project, to obliterate access roads and patrol by air, which would permit reestablishment of wildlife habitat; while these measures are not feasible for the western system applicants, Southern California Edison and San Diego Gas and Electric Company.

Chapter I-337, Paragraph 3: Construction of the new highway to plant, town, and mines will require 39 stream crossings. These plans should be reviewed to keep the number of stream crossings to a minimum. Any culverts used must be properly aligned, laid at streambed levels, and large enough to accommodate flood conditions. Disturbance of stream-channel alignment and banks must also be minimized and the stream banks subsequently stabilized.

Chapter II-4, Paragraphs 3-5: Contains a list of endangered species in the impact areas. The following fishes should be added to the list: (1) humpback chub, (2) bonytail, (3) Colorado cutthroat trout, and possibly other, as yet unidentified, species. The presence of terrestrial wildlife species should be closely reexamined as well.

Chapter II-190, Paragraph 1: The only free-roaming herd of bison outside of a national park are located in the Henry Mountains in the secondary impact area. This isolated population will perhaps receive fallout of acidic and toxic materials, and will be further impacted by increased access roads and human populations.

Chapter II-192, Paragraph 4: Wild trout populations in the secondary impact area will also be impacted as above. Most of these can only withstand limited harvesting and remain self-sustaining.

Chapter II-194, Paragraph 2: This paragraph indicates that Flat and Wild Steer Mesas are crucial mule deer winter range. The pinyon-juniper habitat in the general area of the mesas is also crucial winter range. Reference merely to the mesas is too restrictive to define this crucial winter range.

Chapter II-195, Illustration 22: This illustration depicts wildlife-critical game species habitat. It should also indicate for what purpose the areas are critical or the narrative on adjacent appropriate pages should specifically reference the various circled critical areas. The area circled for mule deer immediately south of Highway 66 should also be indicated for white-tailed deer, since it is also winter range for this species. The Conconine Plateau should be circled as important winter range for elk, mule deer and antelope which move northwest off mountains to the east of Highway 64, such as Sitgraves Mountain, Kendrick Peak, and San Francisco Mountains, onto the plateau in the area west of Highway 64 and north of Highway 66.

Chapter II-199, Illustration 24: This illustration shows endangered, threatened, protected or unique crucial wildlife areas. It should be shown that it is crucial raptor nesting habitat where the proposed Kaiparowits-Phoenix route crosses the Verde River. A survey this year by our Service indicated several raptor nests in this area of which one was of a size and structure indicating it might belong to an endangered Southern bald eagle.

Artist's Insert between II-199 and II-200: The artist's illustration shows five game species and the caption states, "The proposed transmission system would impact habitat for several animal species." This illustration is misleading since the word "several" combined with the illustration of five game animals indicates these are the animals that will be affected, which is not the case. This page, although artistic, serves no useful purpose and we believe it should be eliminated.

Chapter II-200, Paragraph 6: This paragraph discusses elk habitat along the proposed powerline routes in Arizona and should indicate the proposed Kaiparowits-Phoenix route passes through crucial winter range of elk north and south of Highway 66. It would help to reference Illustration 22 for this discussion.

Chapter II-201: The power transmission system will bisect ranges and migration routes of many wildlife species. The effects of high-voltage electrical fields on use of and migration patterns through these areas are not well known. There appears to be some reason to believe that domestic pigs at least can detect electrical fields. The desert bighorn sheep and some rare animal species within these corridors are of particular concern. The added access roads into these areas are also of concern.

Chapters II-201 and II-202: These pages discuss antelope habitat along the proposed powerline routes. That area along the proposed Kaiparowits-Moenkopi-Mohave route from Page, Arizona, to the Peacock Mountains, about 20 miles northeast of Kingman, Arizona, should be included in this discussion.

Paragraph two on II-202 reads "Ocoonino Plateau near Williams is important winter range for antelope..." This should be changed to read "Ocoonino Plateau and the areas circled on Illustration 22 north and south of Highway 66 near Williams are important winter range for antelope..."

Paragraph three on II-202 reads "Sycamore Mesa north of Phoenix supports a small population of antelope. This area is crucial to the survival of this herd." This should be changed to read "Sycamore,

Perry's, and Black Mesas north of Phoenix support small populations of antelope. These areas are crucial to the survival of these populations."

Chapter II-202, Paragraph 6: This paragraph discusses peccary habitat along the proposed powerline routes. It should be indicated that peccary have been introduced near the Kaiparowits-Moenkopi-Mohave line in the area of Cottonwood Wash west of Cottonwood Cliffs.

Chapter II-202 and II-203: These pages discuss mountain lion habitat along the proposed powerline routes and should include that area along the proposed Kaiparowits-Moenkopi-Mohave route where it passes through the Aubrey Cliffs area, since this is good habitat of their primary prey, the mule deer.

Chapter II-207, Paragraph 2: This paragraph covers habitat of the golden eagle and the northern and southern subspecies of the bald eagle in areas along proposed transmission line routes. It should be stated that the northern bald eagle winters along the Verde River where the proposed Kaiparowits-Phoenix transmission line route crosses the river and that one of the raptor nests in this area may be that of an endangered Southern bald eagle.

Chapter II-208, Paragraph 2: This paragraph states that large numbers of birds are seldom seen at any one time or place, except in Overton Wildlife Management Area. It should be indicated that another exception is where the proposed Kaiparowits-Phoenix transmission route crosses the Verde River.

Chapter II-215, Paragraph 5: This paragraph also discusses the habitat of the endangered Southern bald eagle; therefore, see our comment for Chapter II-207, Paragraph 2.

Chapter II-216: Virtually all species of life encountered along the transmission line route are directly or indirectly dependent upon the water supply. Some plants and smaller organisms are dependent upon particular water holes and springs. Water, gravel, and sand removed from areas along the transmission route should be strictly controlled.

Chapter II-220, Figure 43: This figure indicates the Virgin River is crossed by the proposed transmission line route in Nevada. Maps on I-194 and I-195 show that the Virgin River is not crossed in Nevada. The map on I-193 is difficult to read, but it appears the Virgin River is either crossed in Arizona or Utah, or both. This discrepancy should be clarified and a more legible map showing the relationship of the Virgin River to the proposed transmission line route in Utah and Arizona provided.

The exact area of the crossing is important since the Virgin River is inhabited by the woundfin, an endangered fish, and the Virgin River spinidace, a fish listed in Group IV of Arizona Game and Fish Department's Proposed List, Arizona Problem Species, April 16, 1975.

Chapter II-224, Paragraph 1: The last sentence of this paragraph states "The Gila topminnow discussed in the threatened species section has expanded its range upstream to the area of these crossings ("these" refers to the proposed Kaiparowits-Phoenix transmission line route)." The words "has expanded" should be preceded by the word "possibly."

Chapter II-349, Paragraphs 2 and 3: These two paragraphs indicate the proposed Kaiparowits-Phoenix transmission line route parallels transmission line corridors delineated in RLM and Cocchino and Prescott National Forests management plans. As indicated in our general comments, from a wildlife management viewpoint this is not the best corridor. While this corridor may be desirable esthetically because it generally cannot easily be seen from highways and heavy use recreation areas, it does little to alleviate adverse impacts on wildlife resources or for people who enjoy esthetics in back country areas.

Another misleading factor when considering powerline corridors in Federal lands such as those controlled by RLM and PS, is that even though a designated corridor may be the best available in the Federal lands, more suitable corridors may exist in adjacent state and private lands. The proposed Kaiparowits-Phoenix route passes for about 70 miles exclusively through western portions of the Kaibab and the eastern segment of the Prescott National Forests, when much lesser adverse impacts would occur to wildlife habitat if the route was aligned through Chino Valley to the west, which is composed of state and private lands.

These two paragraphs also indicate that although the proposed Kaiparowits-Phoenix route parallels corridors established by RLM and PS, neither agency intended that transmission line applicants propose a separation of 2000 feet between powerlines. Since this great a separation would require as much access road construction for each new powerline as the preceding one, we believe the right-of-way granting agencies, in this case RLM and PS, should grant rights-of-way in suitable existing corridors, which this corridor is not from a wildlife management standpoint, only if the new transmission lines are placed as close as possible to existing powerlines so existing access roads can be used.

Chapter III-73, Paragraph 1: After reseeded to prevent erosion, the waste-disposal area should be fenced to exclude animal grazing on plants that will probably contain toxic materials.

Chapter III-138, Paragraph 5: This paragraph indicates the amounts of new and temporary access roads that will be required for the primary,

northern Kaiparowits, and Arizona Strip transmission line proposals. See our comment for Chapter I-240, Paragraph 4 concerning the primary proposal, since it also applies to the northern Kaiparowits and Arizona Strip proposals.

Chapter III-159: The greatly increased local population and access roads will deplete native fish and game populations and greatly increase fish and game management costs and problems in the area. These same factors will accelerate the destruction of the wilderness and aesthetic values of the area.

Chapter III-171, Paragraph 4: This paragraph discusses impacts the proposed transmission lines will have on raptors. The last two sentences state "The most crucial area is the Beaver Dam Mountains. This area would be impacted if the line were constructed during the spring raptor nesting season in the area." These two sentences should be changed to read "The most crucial areas are the Beaver Dam Mountains and the Verde river crossing. These areas would be adversely impacted if the lines were constructed during the spring raptor nesting season."

Chapter III-345, Paragraph 4: This paragraph indicates hunting would benefit from increased access roads proposed along the routes. This contradicts statements made at III-163, paragraph 2; III-167, paragraph 2; and III-169, paragraph 1, which indicate animal populations will be adversely affected by access roads. While hunter access would be improved, hunter success would decline due to reduced animal populations. This has been the case on Perry's Mesa as a result of excessive pressure placed on the mule deer herd because of the Navajo Transmission Lines access road.

Chapter IV-16, Paragraph 2: Soil permeability and percolation rates would be expected to increase under the increased head pressures of the reservoir.

Chapter IV-22, Paragraph 1: Provisions should also be made for periodic inspections of pollution controls and emissions control equipment by concerned state agency officials.

Chapter IV-24, Paragraph 2: The statement does not describe what action will be taken if the water quality monitoring program shows that important springs, seeps, or bays in Lake Powell are being significantly impacted by powerplant operations. Perhaps some guidelines should be set up detailing what mitigation, if any, will be required.

Chapter IV-24, Paragraphs 4-5: Who will bear the cost of the increased salinity of the Colorado River?

Chapter IV-26, Paragraph 3, Items 2-6: All unpaved roads should follow the latest Forest Service guidelines for construction and maintenance of logging roads or other equal standards. This provides periodic rises in downgrades to control runoff water velocity and frequent roadway exit areas for water.

Chapter IV-27, Item 9: A convex shape to the top of the waste area would reduce contact of the water with waste materials and, thus, reduce contamination.

Chapter IV-37, Paragraph 3: Perhaps equal effort should be made to maintain flows of watercourses, springs, and seeps at their present flow levels and purities.

Chapter IV-47, Item 38: In no case should unused concrete be dumped into streams or other bodies of water.

Chapter IV-48, Item 42: This refers to the applicant's mitigating measure Item 42 and indicates that access roads on the western transmission line system will be maintained in as near their original state as possible. Our combined comment for I-243, paragraph 2; I-299, paragraph 4; and I-301, paragraph 3 is applicable here. Wherever possible, access roads into remote or valuable wildlife areas should be blocked or protected from indiscriminate use.

Chapter IV-49, Item 4b(2): Care should be taken not to remove any more debris from streams than absolutely necessary. Excessive debris removal operations can seriously damage a stream. Some stream cover is necessary in a healthy, productive fish stream.

Chapter IV-55, Item 23d: Add - Prevent release or disposal of oils or other petroleum product in streams or other bodies of water.

Chapter IV-65, Item 10: It is unclear from this discussion how far from springs and seeps construction will be allowed.

Chapter IV-66, Item 15: Add - Removal or disturbance of vegetation should be kept to a minimum. Often bulldozer operators will "manicure" an area because it looks good, only when a small amount of vegetation and soil needs to be disturbed.

Chapter IV-68 and IV-69, Item 22: We suggest adding an aquatic biologist to the team so that springs and seeps located as a result of this requirement could be adequately inventoried for threatened, endangered, or unique species.

Given the implications of Section 7 of the Endangered Species Act, we believe that the mitigating measure described under (1)(a) would have more beneficial results if construction within this two-mile radius of an active, threatened, or endangered raptor nest was limited to helicopter construction since it is primarily the newly created access road that leads to the demise of raptors due to increased human access to raptor nesting sites.

Chapter IV-69, Item 23: If it is absolutely necessary that the participants build (1) along the proposed Kaiparowits-Phoenix route in the Kaibab and Prescott National Forests and across Sycamore, Perry's, and Black Menas south of the Prescott National Forest and (2) 2000 feet away from the existing twin 500 KV Navajo Project Transmission Lines, then the participants should be required to build by helicopter in the crucial deer, elk, and antelope winter range circled on Illustration 22, Chapter II-195, immediately north and south of Highway 66 near Williams and across the three mesas, which are crucial for antelope kidding and mule deer fawning. Another access road across these mesas could eliminate the antelope herd and greatly reduce the mule deer herd. Both populations were seriously impacted by the twin 500 KV Navajo Project Transmission Lines access road. We understand it is difficult for the applicants to build more than several miles by helicopter without having road access. This road access could be designated in least crucial areas.

Also, if it is absolutely necessary to have the 2000-foot separation, then in the crucial deer, elk, and antelope winter range north and south of Highway 66 the transmission line should be built west of the twin 500 KV Navajo Lines. This would place the line in less critical winter habitat than if it were built 2000 feet east (upslope) of the Navajo Lines.

Chapter IV-70, Item 25, Part b: We believe one-fourth mile does not represent much of a physical barrier for protecting the endangered black-footed ferret from man's intrusion. A ½-mile boundary would be more satisfactory.

Chapter IV-72, Item 30: Would it be possible, or desirable, to reduce or limit the voltage of lines crossing particularly critical areas?

Chapter IV-76, Item 41: See our general comments relating to this "out-of-sight, out-of-mind" philosophy.

Chapter IV-77, Item 47: We believe the crucial deer, elk, and antelope wintering areas immediately north and south of Highway 66 near Williams and the crucial mule deer fawning and antelope kidding areas on Sycamore, Perry's, and Black Menas should be included on this list.

Chapter IV 87, Paragraph 3: There will be about 30 round trips of limestone-hauling trucks per day through a portion of Bryce Canyon National Park. This will affect the scenic beauty, noise level, traffic patterns, and perhaps increase accidents in the park.

Chapter VII-70, Kaiparowits to Eldorado (Illustrations 16 to 16m): It is extremely difficult to get an overview of the alternatives by flipping back and forth among 16 maps. A single map showing all the alternatives, as was done for the Kaiparowits-Phoenix system (VIII-104), would be helpful.

Chapter VIII-92, Navaho-McCullough alternate: This alternate is preferable to the proposed route because it follows the existing Navajo-McCullough transmission line and would not disturb crucial Gambel's quail habitat along the proposed route.

Chapter VIII-93, Highway 91 alternate: This is the most preferable route through the Beaver Dam Mountains from a wildlife standpoint. Impacts on raptors, Gambel's quail, and Gila monsters would be much less along this alternate than along the proposed route or other alternatives.

Chapter VIII-97, Blake's Lambing Ground alternate: Cedar Wash has been designated by consultants for the western transmission line system as prime Gila monster habitat in the Beaver Dam Mountains.

Of the various routes through the Beaver Dam Mountains, the route with the least adverse impact on wildlife is the Highway 91 alternate since it avoids important raptor, Gambel's quail, and Gila monster habitat crossed by other routes. The worst route is the one proposed since it is the only one passing through Cedar Wash.

Chapter VIII-100, Railroad Pass alternate: This alternate is preferable to the proposed route from the Eldorado Substation north to where it crosses the proposed route in Railroad Pass since it avoids, except in one small area, a bighorn sheep migration route. However, north of Railroad Pass the proposed route is preferable to the Railroad Pass alternate since the proposed route avoids important winter sheep habitat to the east, which this alternate passes through.

Chapter VIII-128, Agua Fria alternate: This alternate is preferable to the proposed route because it avoids critical antelope kidding and mule deer fawning areas on Sycamore, Perry's and Black Mesas, east of

Interstate 17, which the proposed route passes through. However, this alternate also passes through good wildlife habitat. We believe the best alternative for this area, to avoid excessive impacts on wildlife, is to construct the powerline adjacent to the west side of Interstate 17 from Cordes Junction south to New River.

For a consideration of alternatives north of Cordes Junction in Chino Valley which would have far less impact on wildlife than the proposed alternative, see our general comments and our comment for Chapter VIII-350, Alternative Means of Meeting Project Objectives.

Chapter VIII-137, Figure 5: This figure compares impacts between the proposed Kaiparowits-Phoenix transmission line route and the various alternative routes. It shows that the adverse impacts for terrestrial wildlife and terrestrial ecological interrelationships are rated medium for the Agua Fria alternative and slight for the proposed counterpart. This is grossly incorrect and contradicts comments made in other sections of the EIS. As we have indicated earlier in our comments, the mesas crossed by the proposed route are crucial areas for antelope kidding and mule deer fawning. These mesas are incised by many well-vegetated side canyons off the Agua Fria River and are also important habitat for Peccary and Gambel's quail, as well as numerous nongame species of birds, mammals, and reptiles. The proposed route should, therefore, be rated high rather than slight. About 15 miles of these mesas are crossed by the proposed route in this area.

Chapter VIII-136, Kaiparowits to Moenkopi to Mohave (Illustrations 18 to 18a): Our comment for Chapter VIII-70, Kaiparowits to Eldorado (Illustrations 16 to 16m) is applicable here.

Chapter VIII-210: This table shows that there are only 50 miles of proposed transmission lines for the primary proposal that will be separated by 2000 feet from existing transmission lines. We believe this figure is in error and that the actual value is closer to several hundred miles.

Chapter VIII-350, Alternative Means of Meeting Project Objectives: In reviewing this section we found no mention of whether or not the twin Navajo 500 KV Navajo Transmission Lines from the Navajo Generating Station near Page, Arizona, to Phoenix are carrying their full capacity. It is possible they are not since only one of the three generating units is presently operating. If they are not at capacity, a short transmission line from the proposed Kaiparowits Generating Station to the Navajo Generating Station would permit full use of these lines thus delaying the need for another 500 KV line. We believe this alternative should be discussed in the EIS. The draft EIS considers no proposed

or alternative transmission line routes from the entry of the proposed route into the Kaibab National Forest northwest of Williams to New River, about 100 miles south, acceptable from a wildlife standpoint. Our general comments and our comment for Chapter II-349, paragraphs 2 and 3, indicate there are alternative routes not discussed in the EIS that would be acceptable to wildlife management. The delay discussed above, if practical, would provide more power to Phoenix and allow additional time to assess alternatives acceptable to wildlife interests. We now know that alignment of the Navajo Transmission Lines in the above-described area was a mistake, biologically, and widening of the existing right-of-way will not be acceptable.



The Maricopa Audubon Society

4619 East Arcadia Lane • Phoenix, Arizona 85018

Sept 30, 1975

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Director, Bureau of Land Management
Utah State Office
P.O. Box 11505
Salt Lake City, Utah 84111

Dear Sir:

Enclosed is a copy of the statement presented by the Arizona Audubon Council at the Sept. 17th Phoenix hearing concerning the Kaiparowitz EIS. This chapter fully endorses this statement.

Very sincerely,

Robert A. Witzeman

Robert A. Witzeman, M.D., President

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1 please signify by raising your hand and I will kind
2 of watch for that and try to improve the public
3 address system or whatever else it is that's giving
4 us the hearing problem. The first registrant is
5 T. A. Riehl, R-i-e-h-l, of Tucson, Arizona, indicating
6 representation of the Tucson Audubon Society.

7 MR. RIEHL: Good afternoon, gentlemen. I am
8 here today representing the Tucson Audubon Society to
9 add it's voice to those who are opposed to the
10 approval of the proposed Kaiparowits power plant.
11 Our first concern is the impact of this power plant
12 and what it will have on the beautiful and
13 unindustrialized part of our country. Our second and
14 more important concern is this plant is being built
15 primarily for the benefit of a neighboring state that
16 is unwilling to build such plants within its own
17 boundaries. Yet at the same time four estimates by
18 the Public Utilities of that state are predicated
19 on an assumption that the citizens of California are
20 either unable or unwilling to curb their appetite for
21 ever increasing use of electrical energy.

22 It is proposed that the Kaiparowits
23 power plant be built on a plateau which now dominates
24 scenes of indescribable beauty. Furthermore within
25 and adjacent to the same plateau is some of the most

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1 fantastic and ecologically fragile land within the
2 United States. Within a 200-mile radius of the
3 proposed Kaiparowits plant are eight national parks,
4 twenty-six national monuments, three recreational
5 areas, two national historical sites plus a national
6 memorial. The concentration of the national park
7 units within this area combines and comprises one-fifth
8 of our total park acreage. And who wants the major
9 output from this plant? California -- a state that
10 will not permit the construction of similar plants
11 within its own borders yet it justifies the need for
12 additional electrical energy and assumption that it
13 cannot institute a program for energy conservation
14 that it would not require additional sources of
15 electrical energy from outside the state borders.
16
17 Figures published by the California
18 utilities show that they now consume a peak load of
19 30,000 megawatts that have the capability of
20 producing 38,000 megawatts. In addition to this there
21 is approved and under construction an additional
22 5,600 megawatts. By 1984 they will therefore have
23 available a projected capacity of 43,600 megawatts
24 but they claim that this will not meet their
25 requirement. California is trying to justify the
construction of the Kaiparowits power plant in order

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1 to handle a fantastic 6.8 per cent annual compound
2 growth rate which they admit allows for no effort of
3 conservation on the part of the citizens of that
4 state. To bring this projected growth rate of
5 6.8 per cent into proper focus it should be compared
6 with the national growth rate of a recent Federal
7 Power Commission figure of one-half of one per cent.

8 And what would be the physical effect on
9 the area surrounding the plant as well as the
10 land between Kaiparowits and California. First, the
11 daily disposal of 2,400 tons of fly ash plus another
12 309 tons of lime SO₂ residue. Mr. Howard just touched
13 on that briefly. I have something to say that
14 during the projected life of this plant this would
15 amount to 60-million cubic yards of sludge, enough
16 to cover 450 adjacent areas to a total of 90 feet.
17 Second, this plant will consume some 50,000 acre-feet
18 of water annually from the already limited
19 Lake Powell supply. The irony of this is that the
20 water will be taken from Utah's share and not from
21 California's share.

22 A third feature that would greatly
23 effect this area will be the building of 2,000 miles
24 of access road. Included is contemplated a road
25 from the limestone quarry 16 miles northwest of

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1 Bryce Canyon in the park right through the park
2 itself. This road will transport 237,000 tons of
3 limestone annually requiring the service of
4 25,000-ton trucks making 30 round trips through our
5 national park. And finally, to get this electricity
6 to California will necessitate 1,500 miles of
7 additional transmission lines, much of which will go
8 through the northern part of our own State of
9 Arizona.

10 The State of Utah is encouraging the
11 building of this power plant as it can well envision
12 the mining of 12-million tons of coal annually plus
13 the operation of the power plant, both giving
14 employment to 2,400 workers both indirect and direct,
15 over the 35-year life span of the operation itself.
16 No figures have been published on the cost of
17 building a community housing approximately 15,000
18 people that will be accumulated here.
19 Necessary services such as police and fire protection,
20 adequate drinking water supplies, sewer disposal,
21 schooling and medical facilities must all be supplied.
22 In addition there will be the more intangible social
23 and psychological problems which have plighted
24 similar towns in Wyoming, Montana and some extent
25 even here in Arizona.

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1 The states of Utah and California are
2 dealing here not with an area of purely local
3 interest and concern but one of national significance
4 that belongs to all Americans and we owe it to the
5 present and yet unborn future generations to retain
6 this heritage in its beautiful and undefiled state
7 for their enjoyment. This sole beneficiary of the
8 electrical energy to produce is located some
9 500 miles distant and seems to have no concern over
10 what harm might be done through the building of this
11 expensive plant at this proposed location.

12 Your former Secretary of the Department
13 of Interior, the Honorable C.B. Morton, in July
14 of 1973 rejected the application to build a power
15 plant on the Kaiparowits plateau. At that time he
16 made the statement and I quote, "It would impose
17 severe additional impacts upon this major recreational
18 area. The scenic beauty of this rugged Southwest
19 landscape coupled with the clarity of the air in the
20 vicinity are national assets of extreme and major
21 importance worthy of protection for the enjoyment
22 of future generations of America." We believe that
23 these words are as applicable today as when
24 originally uttered and therefore do earnest request
25 that you recommend to the new Secretary of the

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1 Department of Interior that he also reject all
2 permits for the building of a power plant in the
3 Kairparowits area. Thank you very much for letting
4 me make this.

5 MR. SWEITZER: Question please.

6 MR. HOWARD: Mr. Riehl, you cited figures
7 such as 43,600 megawatts in California generation.
8 Did that figure come from the Impact Statement or
9 other sources?

10 MR. RIEHL: It came from figures that were
11 released by the State of California utilities
12 to the best of my knowledge. I can check that. The
13 person I got it from is in the room here. John, those
14 figures are the utility consumption from California --

15 MR. SWEITZER: Why don't you go off the record
16 for one minute and you can confer with him. I
17 will and then perhaps I can respond.

18 MR. RIEHL: I am pretty sure they were
19 by the utilities company itself.

20 MR. SWEITZER: We will be off the record for
21 one minute. I would like that you all retain your
22 seats because it will be limited to a minute.

23 (Discussion off the record.)

24 MR. SWEITZER: Back on the record. Do you
25 have that information, sir?

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1 MR. RIEHL: Yes. It was as I said originally.
2 It came from the Public Utilities Commission -- those
3 figures did -- California.

4 MR. HOWARD: You don't know offhand the
5 particular document?

6 MR. RIEHL: No, I don't. I am sorry about
7 that but the original statement, as I did say, is
8 from the Public Utilities Commission.

9 MR. HOWARD: Another question: You mentioned
10 that in the disposal of solid waste that 450 adjacent
11 areas I believe is the term used and I think you did
12 mean acres.

13 MR. RIEHL: Acres. Did I say areas?
14 I mean acres in the adjacent area. If I didn't
15 I could have. It's in the record here.

16 MR. HOWARD: I expressed concern about a
17 road leading to Bryce Canyon?

18 MR. RIEHL: It is my understanding that it
19 would be to take the limestone on the road coming
20 from Bryce Canyon to the Kairparowits project.

21 I think that's the existing
22 road.

23 MR. RIEHL: But it does go through
24 Bryce Canyon. We take this material through
25 Canyon.

1325 DELAWARE ST. DENVER, COLO. 80204 303/573-9241 COLORADO OPEN SPACE COUNCIL 1325 DELAWARE ST. DENVER, COLO. 80204 303/573-9241

October 26, 1973

Mr. Paul Howard
Utah State Director
Bureau of Land Management
123 South State Street
Salt Lake City, Utah 84111

The Air Quality Workshop of the Colorado Open Space Council (COSC) is concerned about the effect of the Kaiparowits Power Project and other proposed coal-fired power plants on the air quality of the southwestern

United States and on Colorado. We wish to thank the Bureau of Land Management for extending the comment period on the Kaiparowits Project draft Environmental Impact Statement. However, we feel that public hearings should have been held in at least one location in Colorado since the project may still have more environmental impact on Colorado than on California and Nevada, where hearings were held.

Having examined the Air Quality portions of the draft EIS, the Workshop wishes to express its fear that this plant would degrade the air quality in surrounding national parks and monuments to the point that there would be a violation of the National Park Service Act of 1916, which charges the Park Service "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner as will leave them unimpaired for the enjoyment of future generations." In an area noted for its clean and clear skies, a 25% reduction in visibility, even part of the time, is unacceptable. In the event that national park lands are reclassified (as we feel they should be) as Class I air quality areas under the EIA regulations adopted in December 1974, the draft EIS indicates that the time from the Kaiparowits plant could "violate the Class I limitations of those areas." While the timing of permits and changes would probably make this "legal," it would not be in the best interests of the parks and the people who enjoy them.

Particularly disturbing is the fact that nitrogen oxides, which produce a characteristic brown haze, would be reduced only to the

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Point of meeting the federal regulations for new plants (0.70 lb/10⁶ Btu). These are the same regulations that now plants in industrialized areas are expected to meet. We should do better to preserve the unpolluted vistas of southern Utah.

The Southwest Energy Study quoted in the draft EIS, predicted that the emissions of one coal-fired plant would not have a significant additive effect on the emissions of another such plant if they were more than 60 miles apart but could have additive effects if they were within 10 miles of each other. This leaves the Kaiparowits Project, 36 miles from the existing Navajo power plant, somewhere in limbo. While the EIS concludes that "additive effects with the Kaiparowits and Navajo plants should be reduced under worst case conditions," the Workshop feels this implies a reduction in air pollution when actually any change would be one toward deterioratingly polluted air. In addition, the EIS repeatedly states that data are not yet available to assess the effects of the Navajo plant on the regional air quality. Thus it is not possible to accept a possible significant additive effect on top of an unknown increase in air quality degradation.

Therefore, the Air Quality Workshop at COSC recommends that the building of the Kaiparowits Power Project be delayed until (1) studies on the impact of the Navajo plant on air quality have been completed and assessed. Predictions of the impact of Kaiparowits will be on much more solid footing when the Navajo influences are known. Kaiparowits become clearer. With forecasts of completion being released downward yearly it seems prudent at least to postpone a project with such far-reaching impact until its need is verified.

Please enter this letter in the official hearing record on the draft EIS of the Kaiparowits Power Project.

Sincerely yours,

William H. Reed
William H. Reed, Chairperson
COSC Air Quality Workshop

a state-wide environmental coordinating council a state-wide environmental coordinating council

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1 MR. HOWARD: The various points that you

2 expressed concern on, is it your feeling that the

3 Draft Impact Statement does not adequately cover

4 those points?

5 MR. RHEINI: No, I can't say that necessarily.

6 I think the point I am trying to make is that we are

7 defining this area of the country for another part

8 of the United States where they don't want to put

9 their own power plants in.

10 MR. HOWARD: Thank you.

11 MR. RHEINI: I think that's basically what I'm

12 trying to say.

13 MR. SWITZER: Evidently those are all the

14 questions. Thank you, sir. Robert L. Coshland,

15 C-o-s-h-l-a-n-d, of Tucson indicates he represents

16 the National Parks and Conservation Association.

17 MR. COSHLAND: Thank you. "My name is

18 Robert L. Coshland. I reside in Tucson, Arizona

19 and I am the Arizona representative of National Parks

20 and Conservation Association. This organization

21 with headquarters in Washington, D.C., educational

22 and scientific nature, publishes National Parks and

23 Conservation Magazine -- the Environmental Journal --

24 to keep it's 50,000 members informed on ecological

25 matters. For over a half a century it has been a

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Paul Howard, State Director
Bureau of Land Management
125 S. State St.
Salt Lake City, Utah 84111

Dear Mr. Howard:

I am writing to you to ask you to reject the proposed Kaiparowits power plant. I have
made the summary RIS which details the many adverse impacts upon the area. Of those
impacts, probably only the degradation of air quality has peak-load impact. In
Nash. Since I personally receive no benefits from the proposed plant to offset this
adverse effect, I am against it.

But I would like to bring up two much more basic arguments -- (1) I did not find in
the RIS any study of a conservation alternative, such as peak-load shifting of power
in the consumer regions -- alternatives which might eliminate the need for the plant.
Perhaps even more basic is this: (2) The RIS focused only on pollution problems caused
by the burning of the power plant, transportation lines, roads, etc. Even more important
is the additional pollution that will result from increased availability of power to
the consumer areas. Those areas -- Los Angeles, San Diego, etc. -- are already some
of the most heavily polluted areas in the country. More power will bring more growth,
people, cars and all the inevitable pollution that results from large concentrations
of people.

I believe that enlightened national policy would discourage growth in areas where
large concentrations of people have already made pollution problems severe. If
Kaiparowits is built at all, its power should go to areas where growth can occur
without excessive pollution. I believe that these two distinctions in the RIS are
sections, and I believe that they would form a solid basis for a court challenge of
the adequacy of the RIS in the event that the power plant is approved.

REAL PEOPLE PRESS

BOX F MOAB, UTAH 84402

October 27, 1975

John O. Stevens
Editor and Publisher

cc:jf

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(801) 252-7578

IX-561



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October 28, 1975

Mr. Paul Howard, Utah State Director
Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

Thank you for allowing our regional office to officially comment on the Kaiparowits Thermal Power Plant EIS.

The project is so unbelievable in scope, potentially disruptive and unnecessary, that rather than belabor you with mind boggling statistics and unanswerable questions, I would like to address only one point.

That is, if only a small percentage of the money, energy units, water, manpower, etc. needed to construct Kaiparowits and all its ancillary needs were instead invested to upgrade our nation's agricultural productivity base, I am willing to bet that through international trade agreements, more energy equivalents could be imported (e.g. low sulfur Indonesian oil for Southern California Electric) than produced by the Kaiparowits Plant and all the others planned for Southern Utah.

This is not even a respectable gamble over the next half century since the world's food productivity can never match its needs and the U.S. potentially has an agricultural cartel.

Just for one moment reflect on the need to repair the overgrazed lands your agency administers. BLM range economists and agronomists could certainly fairly accurately predict output as a function of input (dollars into rehabilitation). This output could then be converted into energy imports.

I hope the leaders in government will ponder this before they

Page 2

become "locked onto" massive coal fired plants.

Respectfully,

Robert K. Turner
Robert K. Turner

RKT/dln

cc: Mr. Earl Butz, USDA
cc: Mr. Frank Zarb, FEA
cc: Mr. Jack Horton, Assistant Secretary of the Interior
cc: Senator Floyd Haskell, Chairman, Senate Interior Subcommittee, Public Lands

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IX-563

TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401

OCT 28 1975

Mr. Paul L. Howard
Utah State Director
Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

We appreciate the opportunity to review the draft environmental statement on the proposed Kaiparowits Power Project in Southern Utah. We found the statement to be interesting and informative.

Sincerely yours,

Peter A. Krenkel
Peter A. Krenkel, Ph.D., P.E.
Director of Environmental
Planning

October 29, 1975

Mr. Robert O. Buffington
State Director
Bureau of Land Management
U.S. Department of the Interior
2400 Valley Bank Center
Phoenix, AZ 85073

Dear Bob:

I have just been reviewing your Kaiparowits remarks on that portion of the proposed line which crosses the Arizona strip country.

Our firm, F. J. MacDonald and Associates, worked on the environmental impact statement for Los Angeles Water and Power on the first lines that are now crossing the strip country. Our first choice for routing was the one that is now labeled "preferred alternate." However, a special team from BLM was sent out from Washington and made a survey and environmental analysis of this entire area, and it is their recommendation that the line be moved north to its present route and that this corridor would be able to accommodate future lines. Even though we disagreed with this, we worked with BLM and Los Angeles Water and Power because we felt that, if we could contain all the lines in one corridor, it would be good even though it wasn't the best corridor selection.

Now we are faced with the power company and/or BLM proposing to move out of the already established corridor. I can assure you that the reaction of the Governor's Commission on Arizona Environment, my Land Planning Committee Chairman, and the Natural Resources Chairman will be violently opposed to such a move. It has been our understanding that future lines would go into existing corridors, and I believe this case in point is an excellent example where this criteria fits.

Yours sincerely,

GOVERNOR'S COMMISSION ON ARIZONA ENVIRONMENT

F. J. MacDonald
F. J. MacDonald
Chairman

FJM:ph



F. J. MacDonald



ARIZONA WILDLIFE FEDERATION
P.O. Box 1769 • Phoenix, Arizona 85001 • Phone (602) 252-7371



November 5, 1975

DOUGLASS C. BAKER
President

Mr. Paul L. Howard, State Director
BUREAU OF LAND MANAGEMENT
Federal Building
135 South State Street
Salt Lake City, Utah 84111

Mr. Howard:

The Arizona Wildlife Federation on September 29, 1975, forwarded a letter to you commenting on the Kaiparowits Draft Environmental Impact Statement.

At this point we would like to make additional comment. We recently became aware of the fact that one of the transmission line routes (Northern Kaiparowits Mohave 500 KV T/L) the power companies want to construct would go through the Hurricane Cliff and Virgin Mountain areas in the extreme northwest corner of Arizona and NOT through the existing corridor that we understood was set up to take care of ALL transmission lines in that section of the state. We want to go on record as being strongly opposed to the construction of any NEW corridor in that area because of the devastating effect on wildlife and wildlife habitat that would result.

In fact, we are very concerned about all the approximately 1900 miles of new access roads (870 miles permanent, 1,030 temporary) that would be required along the proposed transmission systems rights-of-way. It is not readily apparent from the draft where these access roads would be established and we feel that critical habitat could be eradicated. Was consideration given to the fate of the desert bighorn sheep in the Black Mountains?

Another point for concern is the level of mercury in Lake Powell; the DES indicates that the already high levels would be increased. Great numbers of fishermen from several states now use Lake Powell and fish unfit for human consumption would greatly limit its recreational value.

We are concerned about the amount of input received by those preparing this DEIS from the Game and Fish Departments of those states that will be effected by this vast project. We would hope that in the Final Draft, there might be a high degree of input from these departments. One of the major limiting factors for wildlife is the availability of suitable habitat; we feel that this project will negatively effect

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Mr. Paul L. Howard
November 5, 1975
Page two

vast areas of habitat which in turn will have a negative effect on the wildlife.

Thank you for this opportunity to comment.

Sincerely,

Douglas C. Baker

DCB/tw/dg

cc: J. Russell Penney, State Director, California BLM
E. I. Rowland, State Director, Nevada BLM
Robert O. Buffington, State Director, Arizona BLM
E. Charles Fullerton, Director, California Dept. of Fish & Game
Glen Griffith, Director, Nevada Dept. of Fish & Game
John E. Phelps, Director, Utah Div. of Wildlife Resources
Robert A. Jantzen, Director, Arizona Game & Fish Dept.
Bruce Duke, Arizona Game & Fish Dept.
California Wildlife Federation
Nevada Wildlife Federation
Utah Wildlife and Outdoor Recreation Federation
Thomas L. Kimball, National Wildlife Federation
Wm. Reavely, National Wildlife Federation
Edwin Merrick, National Wildlife Federation

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IX-555

SIERRA CLUB



SAN DIEGO CHAPTER

HOUSE OF HOSPITALITY
1549 EL PRADO, BALBOA PARK
SAN DIEGO, CALIFORNIA 92101
October 27, 1975

The San Diego Chapter of the Sierra Club submits these following comments for your review on the Kaiparowits project draft environmental impact statement.

The draft E.I.S. reasons the need for the Kaiparowits project based on the Federal Energy Administration report of Appendix 1-1 of the E.I.S. Here the FEA states that the utilities forecasts were the best available on which to show the need but even if incorrect, F.E.A. concludes, it would be deemed necessary to build the coal fired plant because of the President's goal to eliminate by 1980 oil fired plants from the Nation's baseload generating capacity. We consider this attitude to be arrogant and arbitrary. Such a conclusion ignores the orderly approach to meeting our energy needs, mindful of the environmental impacts, through a combination of energy conservation measures, a strategic mix of energy sources, and growth policies at the local and regional levels. The report prepared for the BLM in Appendix III-9 points out the complexities in reviewing the impacts of additional energy in the Kaiparowits Market area. The causes for the urban-sprawl in Southern California, this reports states, is due in part for the want of local and regional growth management plans. Yet the E.I.S. does not take positive steps through joint action by Federal, State, and Local governments in preparing impact statements of the Market area and in assuming leadership in implementing energy - growth policies. The practice whereby the forecasts generated by the utilities independent of any joint planning with the communities they serve must be stopped.

The E.I.S. does not specifically identify the growth policies of the San Diego Area. The recent election for the office of mayor showed the voters giving

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- 2 -

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an overwhelming majority vote to the incumbent running on a managed growth platform. His major opponent was heavily backed by the development and pro-growth factions. While the city has made some steps toward achieving a comprehensive growth plan, critical plans still must be formulated and adopted. The sentiments of the voters would indicate a favorable atmosphere toward achieving this end.

Recent actions taken by the California Public Utilities have been directed toward encouraging energy conservation. A \$105 million rate increase sought by San Diego Gas and Electric Company was cut to \$27.2 million by the P.U.C. on October 15, 1975. The rate structure has been revised which encourages householders to conserve power. Users below certain monthly amounts will have their rates decreased while those above these amounts will have graduated increases with the amount used. While a lifeline plan wasn't included during this latest P.U.C. action they have served notice to S.D.G.&E. to plan for this rate structure.

The P.U.C. has also indicated that plans are being created to require utilities in the Southern California area to pool their reserve generating capacities. This action would reduce the need for new generating plants, while maintaining the reliability of the total system at desirable levels.

The E.I.S. in its analysis of the project and the alternative approaches does not use the net energy analysis now coming into use.¹ We consider this to be a shortcoming. The net energy analysis technique can bring added information to bear on making decisions on large scale projects such as this. It can also be used to examine in totality the many proposed coal based energy production projects in Southern Utah. The E.I.S. does not even place the Kaiparowits project in view of these other proposals. Economic assessments of the various aspects of the Kaiparowits project have been made in the E.I.S. The conclusions resting on this approach gives only a limited picture of the true environmental costs or 1. Gilliland, M.W. "Energy Analysis and Public Policy," Science 26 September 1975

benefits. To illustrate this point, consider an accounting of the net energy supplied to a customer. The delivered energy is charged not only for the prime source of energy but also that energy associated with the extraction and processing needed to transform the prime energy source into the delivered form. Added to this is the energy burden of such items as the pollution control and abatement required to mitigate the impact of the production and use of that delivered energy. This accounting procedure would show for example, the magnifying effect of increasing the net energy available when a given amount is saved at the customer level.

In the discussion of the sulfur dioxide removal methods, the E.I.S. considered only the stack scrubber technology. The wet lime system that was selected for Kaiparowits has the disadvantage in that large amounts, up to 1340 tons/day, of wastes are formed by the scrubbing process creating disposal and pollution problems. In July of this year, Battelle Institute announced² the newly developed hydrothermal coal process of removing sulfur from coal prior to combustion. This technique does not produce large volumes of waste. Furthermore, the process will remove some of the toxic metals and part of the ash from the coal. As a by-product elemental sulfur and the residue metallic compounds are salable. As a benefit this process produces purified coal which then can be used for making pipeline quality gas or liquid fuels. This fuel would then be shipped to distant generating plants replacing the electrical transmission lines. This process has seen success at a 0.25 ton per day pilot plant but it has not yet been proven for a large scale operation capable of supplying the 3000 MW generators. A delay in the Kaiparowits project will give added development time so that the project may benefit from this new technology in the future.

2. "Cleaning Up Coal: A New Entry in the Energy Sweepstakes" Science, 11 July 1975 Vol. 189.

While the conclusion is correct that wet-dry cooling towers are disadvantaged by their higher energy consumption, it is our opinion that their resulting economic penalty should be accounted in determining the environmental-versus-dollar trade-off. It is the Sierra Club's strongly held view that policy decisions on energy technology must reflect true environmental costs. Therefore, the lack of quantitative trade-off data on the wet-dry tower option is a deficiency of this E.I.R.

It is not correct that wet-dry towers are relatively unproven. Their feasibility is unquestioned and equipment is being marketed. In fact, the San Diego Gas and Electric Company has announced its plans to employ such equipment at its Sundesert Station of comparable size to this.

On the basis of 1) lesser dispersion of salts with resulting lesser impact on the ecology of plant site and its surroundings, 2) lesser aesthetic pollution from vapor emissions, and 3) lesser consumption of water, the wet-dry cooling tower appears to us worth the consequential penalty in plant efficiency.

Environmental impact statements for nuclear power plants include cumulative summary effects of air and liquid borne radiation on both the surrounding population and those occupationally exposed. Such cumulative summary effects can be compared by the lay public to the predicted levels of health and mortality hazard. Similar predictions are published for health effects of the emissions from coal-burning plants. Particularly finite, though small risks to public health and mortality will ensue from this project due to:

- 1) Occupational exposure in construction
- 2) Occupational exposures in operation
 - a) Coal mine accidents
 - b) Black lung and other miner disabilities
 - c) Limestone Quarry accidents
 - d) Power plant system mechanical accidents
 - e) Waste handling accidents

The objective determination of the acceptability of this project must certainly include a consideration of the human lives lost and life shortening effects. The summary portions of this report are inadequately quantized in this respect.

The impact on the water quality resulting from the mining operation and waste disposal from the power plant as well as the loss of 50,000 acre feet from Lake Powell has not been sufficiently detailed in the E.I.S. Because of the millions of people who rely on the Colorado for drinking water and for irrigating the crops they consume, and evaluation of the health effects as a result of this project should be prepared.

³
The recently published Rand Report indicates that natural gas production will be critically low in the next few years but will be expected to increase after 1990, the same time period during which Kaiparowits comes on line. In addition to this increase of available gas, the report predicts a surplus of 500,000 barrels of oil per day by 1978. California may become a state where excess oil will be transhipped to the Midwest and East. This oil is expected to come from Alaska, offshore wells in California and the Elk Hills reserves. Taking this into consideration, a comprehensive plan is necessary in budgeting the use of our energy resources. Regional energy planning should be developed. The Kaiparowits project must be considered in light of the alternative energy sources.

The E.I.S. analysis of the alternatives to the proposed project is limited in its scope. For example, solar energy is discounted as an alternative to producing 3000 MW of electricity. The E.I.S. fails to recognize the need for strategic mix of energy sources as an alternative. Solar assisted heating systems are available. Actions are being taken in Southern California

3. Ahern, William, et al "Energy Alternatives for California: Paths to the Future". and executive summary Rand Corporation, 25 September 1973.

Prepared for the California State Assembly Committee on Resources, Land Use and Energy.

for instance, to prohibit new swimming pools to be built using natural gas heaters. This will free the natural gas for more critical needs. Solar energy can then be used to increase the total net energy. Likewise, conservation methods would have the same effect in increasing the net available energy. These conservation methods are beginning to be implemented now, not at some future time implied in the E.I.S. It is this strategy of using all alternative sources of energy to meet the total, not just electrical, market energy needs that has been ignored by the E.I.S. While the contribution from each of the sources may be small the sum effect becomes significant.

November 2, 1975
1249 Island Dr.
Logan, Utah 84321

Bureau of Land Management
United States Department of the Interior
Federal Building
Salt Lake City, Utah

Dear Sirs:

Please find enclosed my comments on the Kaiparowits Environmental Impact Statement which I wish to be included in the record. I gave testimony at the September hearings in Salt Lake City and left a preliminary draft of my statement with the hearings committee at that time. I would like that draft replaced by my complete statement.

Sincerely,

Jack T. Spence
Jack T. Spence

Kaiparowits Environmental Impact Statement (EIS)

Comments and Critique - Emissions and Air Quality

This paper is a discussion and critique of the sections of the EIS for the proposed Kaiparowits electric generating plant dealing with stack emissions and their effects on air quality and the environment.

The most serious general criticism of the EIS air quality and emission sections concerns the method of predicting air pollutant concentrations and effects from Kaiparowits. These predictions are based primarily on studies prepared or contracted by Southern California Edison using computer models favorable to their position and limited test data from test modules only. No independent studies have been made, nor is there much use of actual field data gathered from similar operating plants.

Considering the fact that a number of generating plants have been operating in the area for some time, the almost complete absence of field data and the almost complete reliance on one computer model (even when the EIS acknowledges there is no generally accepted model) is inexcusable. The result is a falsely optimistic prediction of the effect on air quality in the area, and in some cases is in direct contradiction to the limited field observations reported.

Specific pollutants and effects are treated below.

I. Emissions

A. Particulates.

(1) The EIS indicates 99.5% of the fly ash generated by the plant will be removed. It must first be noted, however, that while the water contract requires an initial design capable of removing 99.5% of the particulates, only 96% removal for a 24 hour period and 97% removal for a month's period are required (IV-22). This is a rather large difference in the amount of emitted

particulates: 97.9 tons/day and 73.4 tons/day as compared to 12.2 tons/day. Thus, although the plant must be designed with a 99.5% removal capability, it is required by the water contract to remove considerably less particulate. This difference between design capability and actual required removal capabilities should be emphasized in the EIS.

(2) While the state of the art for electrostatic precipitators makes it possible to remove 99.5% of the particulates, actual operating data from plants so equipped (Huntington, Mohave, Four Corners, e.g.), indicating the actual amounts removed, should be included in the EIS. A recent report by TVA on the efficiencies of 15 plants equipped with precipitators indicates only one is operating at design efficiency, with the difference varying from a few percent up to 40% lower. It is not clear to what extent the 99.5% predicted removal figure is based on manufacturers specifications, test modules or actual operating data. The inclusion of operating data would increase confidence in the 99.5% removal prediction; in this respect, the EIS is inadequate.

B. Sulfur Dioxide

(1) The EIS indicates 90% of the sulfur dioxide will be removed from the stack gases. Again, it must be pointed out, the most stringent requirement for sulfur dioxide removal is 80%, imposed by the State of Utah (IV-33, III-16). This requirement is currently under consideration for revision which might allow, under certain conditions, even lower removal. At 80% removal 68.4 tons/day of sulfur dioxide will be released, rather than 34.2 tons/day at 90% removal. This important distinction should be emphasized in the EIS.

(2) The 90% removal figure is based primarily on results with a 170 mw test module at the Mohave plant operating over the period January 16, 1974-February 9, 1975. Unfortunately, operating data for actual plants of reasonable size are not available, since none exist. While the data from this test period support the prediction, it is necessary to realize there may be

considerable difference in the results for a one year operation of a 170 mw test module and a 35 year operation of a 3000 mw plant. There has indeed been considerable controversy over the operational reliability of the wet-scrubber process (see attached advertisement, "Request for Scrubbers", published in Time, October 14, 1974, p. 73, or the report of the Commission on Natural Resources, National Academy of Sciences, National Academy of Engineering and National Research Council entitled "Air Quality and Stationary Source Emission Control", U.S. Government Printing Office, 1975, e.g.). While the present state of the art is rapidly improving, predictions of 90% removal of sulfur dioxide for large commercial generating plants must be regarded as unproven. This point should be made clear in the EIS.

C. Nitrogen Oxides

It is estimated the Kaiparowits plant will emit 250 tons of nitrogen dioxide per day under average conditions. Since the nitrogen dioxide is a major factor in plume opacity and is involved in a number of important photochemical reactions contributing to a deterioration of air quality (discussed below), the amounts of this pollutant are of considerable importance. It is difficult, however, to know what 250 tons/day of nitrogen dioxide means without some comparisons. In this section, an attempt is made to obtain some sort of feeling for this quantity of pollutant.

It is well known that a major source of air pollution in cities is the automobile engine. Furthermore, pollutants of major concern are the nitrogen oxides, formed by combustion in the engine. On the average, an automobile engine without controls emits about 5 grams of nitric oxide/mile of driving. This corresponds to about 7.5 grams/mile of nitrogen dioxide. Assuming 100,000 automobiles and trucks operating 20 miles each day in the Salt Lake valley, a total of 15,000,000 grams of nitrogen dioxide are produced from this source each day in the area. This is equivalent to 16.5 tons

of nitrogen dioxide/day. Thus, the Kaiparowits plant will emit about 15 times as much nitrogen dioxide/day as all the cars operating in the Salt Lake valley. This calculation, of course, is only approximate, depending on the validity of the assumptions. It does indicate, however, the magnitude of the amount of nitrogen dioxide to be emitted into the atmosphere by the plant during average operating conditions. Another comparison shows the NO_2 to be emitted is approximately 20% of the total (all sources) NO_2 produced in the whole Los Angeles basin. Clearly, this is an enormous amount of this pollutant, which may lead to high levels of photochemical oxidants (see below). Comparisons similar to this should be made in the EIS to provide a true feeling of the amounts of all pollutants to be emitted.

B. Mercury

The trace metal mercury is a particularly dangerous pollutant since, under aquatic conditions, it is converted by bacteria of the sediments to methyl mercury and concentrated in fish (and other species). In addition to being a deadly poison, methyl mercury is perhaps the most mutagenic chemical known and has been the cause of a number of recent tragedies.

According to the EIS, the Kaiparowits plant is estimated to release 4 pounds of mercury/day from the combustion of the coal. This seems to be a very small amount of mercury. Again, however, a comparison is necessary in order to assess the possible effect of this deadly pollutant.

It is reported in the EIS that mercury levels in some fish in Lake Powell are already very high (greater than 500 ppb, exceeding the upper recommended FDA limit for human consumption, III-154. The method used to estimate mercury levels is reported to give low results, and this figure

should be multiplied by 1.5 (J. M. Wood, Environment, 14 33 (72)), while the average concentration of mercury in the lake water is .01 ppb. Using the figure of 27,000,000 acre-feet as the volume of water in Lake Powell (III-155), a simple calculation indicates the presence of 734 lbs. of mercury present in all the water of Lake Powell. If the plant emits 4 pounds mercury/day, this amounts to 1460 lbs. of mercury/year. In other words, the amount of mercury emitted in a year is about twice the total amount of mercury currently present in all of the water of Lake Powell. A more meaningful comparison, however, is with the current estimated annual accumulation of mercury in Lake Powell from natural sources. According to recent studies (D. R. Standeford, L. D. Potter and D. E. Kidd, Lake Powell Research Project Bulletin, No. 1, June, 1973), 1760 lbs. of mercury/year accumulate in Lake Powell sediments from weathering in the basin. If 32% of the emitted mercury from Kaiparowits enters the system (E. G. Walthers, "Mercury Emission from Navajo Generating Plant", Museum of Northern Arizona, Flagstaff, Arizona, 1971) this will add an additional 467 lbs./year, or an increase of 27%. This puts the amount of mercury to be emitted in the proper perspective. The possible effects of this will be discussed below. Again, the EIS is deficient in not making meaningful comparisons with regard to the amount of such pollutants, and in not pointing out the possible dangers of poisons as methyl mercury.

II. Effects

In general, the effects on air quality and plume opacity of particulate and sulfur dioxide emissions discussed in the EIS may need to be increased if the figures anticipated for removal are in fact not attainable for sustained operation of a plant of 3000 mw. This possibility is supported by observations of the plume of the Navajo plant. According to the EIS predictions, based

primarily on computer model studies, the plume from the Kaiparowits stack will be visible only along its axis under average conditions. This is in contradiction to the observations of the plume from the Navajo plant, which is reported to be visible from all angles (III-3, III-48, III-47, V-14). It should also be pointed out, the Navajo plant is currently operating only two

750 MW unit; Kaiparowits will be operating four such units, so the visibility of the plume will be considerably greater than that of the Navajo plant (both plants are presumably equipped with similar particulate control equipment). This contradiction between computer studies and observations may be due in part to a lower operating removal efficiency of the control equipment in practice than that used in the model studies (in addition, while sulfur dioxide is itself colorless, it is converted, in part photochemically, to sulfur trioxide which combines with water in the atmosphere to form a cloudy aerosol mist adding to the opacity of particulates). Furthermore, the contradiction suggests the computer model used for predicting opacity and air quality may be faulty (see errata sheet, EIS, page III-24 and the discussion concerning nitrogen dioxide below). This contradiction between observation and prediction with respect to plume opacity and visibility is one of the most serious failures of the EIS. Operational data from the Navajo plant would go a long way in correcting this failure.

A major criticism of the EIS concerns the levels of nitrogen dioxide predicted by the computer models. While Figure 7 (III-28) gives the predicted annual level of nitrogen dioxide as $12 \mu\text{g}/\text{m}^3$ (.007 ppm), it does not give the 24 hour nor 3 hour levels of this pollutant. Using the relative respective

source strengths (as compared to sulfur dioxide, III-29), the figures are $241 \mu\text{g}/\text{m}^3$ (.11 ppm) for 24 hours and $980 \mu\text{g}/\text{m}^3$ (.43 ppm) for 3 hours. Furthermore, as described in the errata sheet, Chapter III-24, the use of the NOAA model (Southwest Energy Study) gives much higher (5-20 times) 3 hours levels of sulfur dioxide at three sites (Figure 6). Use of this model for nitrogen dioxide gives $2226 \mu\text{g}/\text{m}^3$ (Kaiparowits plateau, South), $1703 \mu\text{g}/\text{m}^3$ (Kaiparowits plateau, North), and $995 \mu\text{g}/\text{m}^3$ (Right hand Collet) (See Figure 6, III-25).

While there are no 3 hour or 24 hour nitrogen dioxide air quality standards (Figure 7), such high levels are a cause of great concern, particularly with respect to photochemical oxidants (see below). This enormous discrepancy between model predictions also indicates the annual level of nitrogen dioxide predicted by the Intercomp Model ($12 \mu\text{g}/\text{m}^3$.007 ppm - Figure 7, III-28) may be low by a comparable factor. If it is in fact a factor of 10 higher, the annual level of nitrogen dioxide will exceed ambient primary air quality standards (Figure 7). Clearly, such enormous differences in the predicted levels undermine any confidence in the repeated assurances that air quality standards will be met. Much more data, preferably from an operating plant, comparing actual levels of nitrogen oxides with model predictions is necessary before the EIS figures for this pollutant can be accepted.

In addition to these considerations, the effects of specific pollutants are discussed below:

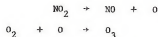
A. Sulfur Dioxide - Sulfuric Acid

As mentioned, sulfur dioxide is converted photochemically to sulfuric acid in the atmosphere. During rainstorms this acid is brought to the earth, decreasing the pH of land and water. Rain and snow from various parts of the U.S. and Northern Europe, e.g., have been reported to have a pH ranging from

3.5 to 5, corresponding to an acidity more than 100 times that of neutral water. The most dramatic effects are seen in lakes, where the pH may drop so low it endangers the aquatic biota. Due to the proximity of Lake Powell to Kaiparowits, this increase in acidity due to sulfur acids may be serious, but the EIS makes no mention of it. It is, of course, difficult to predict the magnitude of this effect. If all the sulfur dioxide to be emitted by Kaiparowits were converted to sulfuric acid and dissolved in Lake Powell, and if the waters of the Lake were completely mixed and no outflow occurred, in one year the pH of the Lake would be lowered from 7 to 5, which would perhaps endanger the biota. Of course, such a calculation, because of the assumptions made is rather meaningless. It does point out, however, that if a substantial amount of the sulfuric acid that will be formed by the plant gets into the lake, serious local effects in some of the many shallow bays may be anticipated. Clearly, more data is necessary to evaluate the long term effects of sulfur emissions on the acidity of Lake Powell.

B. Nitrogen Dioxide - Photochemical Oxidants - Ozone

The EIS discusses the effect of nitrogen dioxide (yellow-brown in color) in increasing the opacity of the plume and decreasing visibility. It makes no mention of the photochemical reactions of nitrogen dioxide. Nitrogen dioxide undergoes photochemical decomposition to produce nitric oxide and oxygen atoms. The oxygen atoms react with oxygen of the atmosphere to produce ozone, a powerful oxidant and a major factor in air pollution:



The ozone formed is partially removed by reaction with nitric oxide:



In areas of high sunlight (as Kaiparowits), considerable amounts of ozone are to be anticipated when nitrogen dioxide levels are high. Ozone attacks organic

matter (including organic molecules in living systems) rapidly. Using published data (P. A. Leighton, "Photochemistry of Air Pollution", Academic Press, New York, N. Y., 1961) for the rates of these three reactions, it is possible to estimate the maximum levels of ozone to be formed. Using the annual predicted level of nitrogen dioxide of Figure 7 (.007 ppm), this gives .005 ppm ozone. The corresponding 24 hour and 3 hour levels are, respectively, .03 ppm and .07 ppm. If the much higher levels predicted by the NIOS model are used (see above and errata sheet) for the three sites designated in Figure 6, the corresponding ozone levels are .10 ppm, .09 ppm and .07 ppm. Two of these levels exceed the federal air quality standard of .08 ppm (which may not be exceeded more than once a year) (figure 2, III-17) and constitute a violation of Class II standards. Also, these levels are close to the maximum allowable industrial exposure of .1 ppm. Such amounts, in addition to possibly being hazardous to workers at the site, particularly during air stagnation periods, would likely be harmful to plant life in the area. Considerable damage to plants and trees has been observed in areas of high ozone concentration (Los Angeles, e.g.). It must be pointed out, however, these calculations are based on the assumption stated in the EIS that all NO in the stack gases is oxidized to NO₂. This, of course, is unrealistic, and the corresponding ozone concentrations will be lower than those calculated values, depending on the actual NO₂/NO ratio. The problem, however, is much more complicated than this. A recent study of ozone levels in generating plant stack gases indicates the plume is depleted in ozone near the plant (probably due to the third reaction above) but in fact becomes a net producer of ozone some distance from the plant. This was

explained in terms of a catalytic oxidation of NO by a photochemical process involving highly reactive sulfur oxide intermediates. This, of course, makes prediction of actual ozone levels very difficult indeed. In view of the enormous amounts of NO_x to be produced by Kaiparowits, however, the possibilities of high ozone levels must be taken seriously. Clearly, more studies of ozone production are needed before the effects of this pollutant can be evaluated.

C. Mercury

The amount of mercury that will be emitted is reported to be 4 lbs./day. This is probably too high, since about 10% will remain in the ash (C. E. Billings and W. R. Watson, Environmental Science and Technology 176, 1232 (1972)) and an unknown amount will be trapped in the scrubber. If 80% of the mercury (3.2 lbs./day) is emitted, this amounts to 1168 lbs./year. If 40% of this amount enters the Lake Powell system, it will add 467 lbs./year, as compared to 1760 lbs./year accumulated from natural sources (Standeford, *et al.*, 1973), an increase of 27%. This will increase the mercury levels in large game fish from 550 ppb to an estimated 769 ppb, making them unsafe for human consumption (FDA maximum levels are 500 ppb). The accumulation over a 35 year period, calculated in the same way, gives over 16,000 lbs. of mercury which may be added to the system from Kaiparowits. How much of this will remain in the lake (mainly as bottom sediments, where it is converted by bacteria to the lethal methyl mercury), and how much will accumulate in fish is unknown. It does seem safe to say, however, the game fishing in Lake Powell will be destroyed, due in part to the mercury emitted by Kaiparowits. The EIS is certainly inadequate in treating the mercury emission problem of the plant.

III. Cumulative Effects of Power Plants on Air Quality and Emissions

Currently there are eleven electric power generating plants, with a combined capacity of 18,690 mw, in operation or planned (by 1985) within 200 miles of Kaiparowits. The EIS (VI-4) gives little attention to the combined effects of the pollutants of these plants. Although the pollutants of one plant may not contribute to the pollution of another at the plant sites, (although this is certainly open to question. Since the Navajo Plant is not equipped with SO₂ removal equipment, the concentrations of SO₂ from the Navajo plant in the Kaiparowits area may be substantial under the right meteorological conditions) the combined effect will be to considerably reduce air quality and visibility over an enormous area -- approximately 100,000 square miles of Utah, Arizona, New Mexico, and Colorado. One of the important ways proposed to ameliorate air pollution is by dilution with clean air. If, however, each plant is effectively polluting its immediate area to the extent contemplated at Kaiparowits, little dilution can occur, and air quality will be lost over the entire region.

The cumulative effect of other pollutants should also be considered. If the mercury emissions of the Navajo, Four Corners, Kaiparowits, San Juan, IPP (Caineville) and Garfield plants (all in the Lake Powell system) are taken together, and the same calculations applied as for Kaiparowits alone, an estimated 2335 lbs./year of Mercury will accumulate in Lake Powell sediments. This is compared to 1760 lbs./year from natural sources, an increase of 133%. Again, the same calculations as for Kaiparowits give an increase in mercury (as methylmercury) in game fish from the present 500 ppb to 1345 ppb (compared to FDA levels of 500 ppb).

One major weakness of the EIS is its lack of treatment of these combined problems. Serious studies should be made to determine the total effect on air quality, visibility and emission impacts for the entire area when all the plants (or a substantial number) are in operation. Kaiparowits cannot be considered on an isolated basis.

IV. Summary and Conclusions

A. Predicted emissions of particulates and sulfur dioxide may be low in view of the limited data base on which they are made and operational evidence concerning the reliability of the equipment. Misleading statements concerning the actual required emissions as compared to design capabilities should be changed.

B. Different models give contradicting results concerning the concentration of sulfur dioxide at various sites, undermining confidence in the models used. When both models are applied to nitrogen dioxide levels, very high concentrations of this pollutant are obtained, which will most likely violate primary air quality standards.

C. Model predictions of plume opacity and visibility are at variance with observations of the Navajo plant plume, again indicating the unreliability of the air quality models.

D. The EIS either ignores or does not treat adequately the effects of the following pollutants:

(1) Sulfuric acid. Produced by photochemical oxidation of sulfur dioxide, much of the sulfuric acid may enter Lake Powell, raising the acidity, particularly of shallow bays, to the point of endangering the biota.

(2) Ozone (Photochemical Oxidants). Produced by the photochemical dissociation of nitrogen dioxide, ozone levels may exceed air quality standards for photochemical oxidants for Class II areas. Serious effects on plant life are anticipated.

(3) Mercury. While the expected emission of mercury appears small, the yearly amounts actually exceed the total already present in Lake Powell waters. Certain game fish in the lake already contain mercury (methyl mercury) in excess of FDA standards and the addition of appreciable amounts from stack emissions will most probably result in the destruction of the game fishing on the lake. The dangers associated with bacterial conversion of mercury to the deadly poison and mutagen methyl mercury (accumulated by the fish) are not explored.

E. Cumulative effects of the 11 planned and operating generating plants in the area with respect to air quality and environment are inadequately considered. Kaiparowits is treated as an isolated system.

In view of these considerations, the sections of the EIS concerned with pollutant emissions and their effects on air quality and the environment are deemed severely inadequate. Much more data, particularly from operating plants, is needed before decisions concerning the environmental impact of Kaiparowits can be rationally made.

Jack T. Spence, Ph.D.
Professor of Chemistry and Biochemistry
Utah State University
Logan, Utah 84322

Requiem for scrubbers

That's what the new page layout of the new edition of the book "Requiem for scrubbers" is all about. The book is a guide to the new edition of the book "Requiem for scrubbers" is all about. The book is a guide to the new edition of the book "Requiem for scrubbers" is all about.

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AMERICAN



RAUL H. CASTRO
Governor

WILLIAM A. ORDAWAY
Director

ARIZONA DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

206 South Seventeenth Avenue Phoenix, Arizona 85007

November 6, 1975

WILLIAM H. PRICE
State Engineer

(82)

Mrs. Constance LaMonica
Arizona State Clearinghouse
Office of Economic Planning
and Development
1624 West Adams, Suite 317
Phoenix, AZ 85007

Re: Draft Environmental Impact Statement
Kaiparowits Power Project
State Identifier: 75-80-0035

Dear Mrs. LaMonica:

The Environmental Planning Services of the Highways Division, Arizona Department of Transportation, has reviewed the Draft Environmental Impact Statement for the Kaiparowits Power Project submitted by the United States Department of Interior.

Since the proposed power plant and its coal mines are located in the State of Utah, only the power transmission lines coming into Arizona have direct involvement with the Arizona highway system. We do not anticipate the proposal, as outlined, will have any significant detrimental impact upon our highway interests.

We are pleased to note much attention is given in the EIS to plans for mitigating visual impact of the power lines as they parallel or cross the roadways and highways. The long spans across the highways and leaving as much vegetation as possible under the power lines will aid in softening visual impact. The plan to use helicopters for air lifting materials and personnel and to use existing trails and roadways where possible for access roads is also noteworthy. One problem found in the areas these power lines will go over is the difficulty in reestablishing disturbed vegetation due to low rainfall and high evapotranspiration. Accompanying the loss of vegetation and loosening of the soil is also a wind blown dust problem which causes hazardous driving conditions due to decreased visibility in some arid portions of Arizona and California.



HIGHWAYS • AERONAUTICS • MOTOR VEHICLE • PUBLIC TRANSIT • ADMINISTRATIVE SERVICES • TRANSPORTATION PLANNING

Mrs. Constance LaMonica

-2-

November 6, 1975

(82)

Since the proposed power transmission lines cross over Interstate and State highways at several points, road repair work may be expected at times. The Arizona State Department of Transportation's Five-Year Construction Plan shows no major construction projects that appear to be directly under the proposed power line crossings. Projects to route U.S. Highway 40 bypass around north of Kingman, Arizona, could possibly be in the vicinity of the Proposed Route Kaiparowits-Moenkopi-Mohave 500 kv T/LS and are as follows:

1. Project Number I-40-1(30)
Topock-Kingman Highway (I-40)
(McConico - Kingman)
Length: 2.64 miles, starting at milepost 46.5
Type of Work: Two 38-foot roadways with grade, drain, structures and asphaltic concrete pavement.
Scheduled for FY 1976-77 Construction
2. Project Number I-16-40-1(27)
Topock-Kingman Highway (I-40)
(McConico Section)
Length: 2.77 miles, starting at milepost 43.8
Type of Work: Two 38-foot roadway with grade, drain, structures and asphaltic concrete pavement.
Scheduled for FY 1976-77 Construction

We appreciate the opportunity to review and comment on this environmental impact statement.

Yours very truly,

WM. H. PRICE
State Engineer

MASON J. TOLES, Manager
Environmental Planning Services

MJT/ADG/cm

cc: Mr. Paul Howard ✓
State Director
Bureau of Land Management
Department of Interior
Utah State Office
Post Office Box 11505
Salt Lake City, Utah 84147

Utah Wildlife & Outdoor Recreation Federation

Affiliated with the National Wildlife Federation

325 WEST 200 SOUTH
SALT LAKE CITY, UTAH 84101
PHONE 801 - 533-5057



16 September 1975

83

RECOMMENDATION TO: BIM Review Board
RECOMMENDATION FROM: Board of Directors, Utah Wildlife and Outdoor Recreation Federation
RECOMMENDATION SUBJECT: Proposed Kaiparowits Project

Dear Sirs:

After diligent study into both the far-reaching detrimental as well as beneficial attributes of the proposed project and in keeping with our constitution, Article 11, section A, "TO ENCOURAGE PROTECTION AND RESTORATION OF WATER, WILDLIFE, FOREST AND FIELD; TO SAFEGUARD PUBLIC HEALTH BY ELIMINATING STREAM AND LAKE POLLUTION; TO DISCOURAGE UNWISE DRAINAGE; TO SEEK WISE LAND AND WATER USE IN THE BROAD PUBLIC INTEREST; AND TO NURTURE AND IMPROVE WILDLIFE STOCKS AS WELL AS TO REHABILITATE AND RESTORE FISH AND WILDLIFE ENVIRONMENT." We of the Utah Wildlife and Outdoor Recreation Federation recommend to the BIM Review Board the following courses of action:

1. We would initially recommend additional, specific and encompassing studies be conducted into the complex floral & faunal communities of the proposed area before anything be decided. We have found the IIS to be incomplete in its study of non-game species of mammals, birds, reptiles, and fish in this most important transitional zone between northern and southern ecosystems.
2. We would further recommend additional time to review the project, the IIS, and other concerns. A December 1975 deadline should provide us with ample opportunity to supply you with specific recommendations on the deficiencies observed.
3. We, as representatives of all the organized sportsmen in the State of Utah feel that to support such a devastatingly permanent environmental degrader of our state would be a gross miscarriage of our responsibility. Therefore let it be resolved that the Board of Directors, Utah Wildlife and Outdoor Recreation Federation opposes the proposed project at this time due to the following reasons:
 - 1) That we as a federation can not find adequate evidence to justify the need for this additional power in the receiver states and that the only justification for the plant seems to be monetary gains. Conservation of necessary power uses and elimination of unnecessary luxuries has not been properly addressed.
 - 2) That the direct pollution/destruction of the delicate desert biome on which the plant is proposed will be devastating to the surrounding area and could conceivably have far-reaching detrimental affects in the future on the entire state.
 - 3) That the indirect "people pollution" caused by the massive number of new residents (30-50,000) in the area would overshadow the direct pollution of the plant considerably and therefore hinder the athletic, recreational, and present sporting endeavors in the area.

November 6, 1975

83

Mr. Paul L. Howard
Utah State Director
Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

This response is in reply to your letters, #2850, Kaiparowits (U913).

Attached for your review and consideration is our position on the proposed Kaiparowits Power Project. Our organization asks for your careful consideration of our recommendations and request that we be advised of the decisions of your office and the Department of the Interior in these matters.

Sincerely,

Dave Wallace
Dave Wallace, President
Utah Wildlife and
Outdoor Recreation Federation

DHW/ld

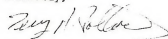
Enc: Kaiparowits Project Recommendations

DAVID H. WALLACE
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VERL C. SHRELL
1ST VICE PRESIDENT
KEITH HENTZE
2ND VICE PRESIDENT
JAMES KEN SHREDDEN
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ALAMOGADO
F. L. "BUDD" BULLIVAN
NATIONAL REPRESENTATIVE
4/1/75-4/1/76
OLAVIE JENSEN
NATIONAL REPRESENTATIVE
4/1/76-4/1/77
HAROLD A. HENTZE
IMMEDIATE PAST PRESIDENT


1X-578

4. We would further recommend that if the proposed project progresses that the following recommendations be presented to the concerned companies and government agencies:
- 1) As a primary alternative the State of Utah agree to transport (by railroad or other device) the coal, limestone & other resources at the companies expense, to a site either outside the state or to an area within the state better suited to regeneration than the desert biome.
 - 2) That regardless of the site chosen, that a non-polluting, non-exhaustable source of energy be utilized rather than coal. Strong suggestions would be NUCLEAR, SOLAR, GEOTHERMAL OR COMBINATIONS OF THE THREE.
 - 3) That meaningful severance taxes be allocated on the coal resources leaving the state or being utilized by out-of-state concerns.
 - 4) That export taxes be allocated on all electrical power leaving the state.
 - 5) That air quality and emission cleanup standard be the same at the point of production of electricity as at the point of utilization of that electricity.
 - 6) That the water allocation utilized in the production of electrical power be purchased on a realistic scale.
 - 7) That the power companies extend monies in the form of grants for additional specific studies of the entire spectrum of:
 - a. floral/faunal communities
 - b. affects of pollutants on the surrounding environment-including metals
 - c. unique geologic, paleontologic, archeologic, and historic features
 - 8) That the power companies provide monies for the study and expeditious completion of specific recreational areas and facilities to handle the expected populus of the area.
 - 9) That the efficient extraction of oil and natural gas be fully realized through specific coal burning processes.

Sincerely,



TERRY A. POLLARD
Director District 7
UWOPF



David H. Wallace
President
UWOPF

COUNTY COMMISSION:
James F. Yardley, Chairman
Wallace Ott
Dale Marsh
Edra Miller, Clerk

GARFIELD COUNTY



Doyle V. Goffam, Assessor
David L. Mower, Attorney
Lyle D. Miller, Recorder
Merle Sigwell, Treasurer
Keith R. Fackrell, Sheriff
Neil K. Duncan, Justice of the Peace

85

November 10, 1975

Gerald Ford
President of the United States
White House
Washington, D.C.

Dear President Ford:

We are closely connected with the Kaiparowits Project and are highly in favor of this project.

We have made an extensive study and see no unfavorable problems if this project is to go forward as planned.

Sincerely,

Garfield County Commissioners:

James F. Yardley
James F. Yardley, Commissioner

Dale Marsh
Dale Marsh, Commissioner

Wallace Ott
Wallace Ott

JFY:ck
CC: Paul Howard
Bureau of Land Management
Salt Lake City, Utah 84111

Coconino-Navajo Counties Central Labor Council

Affiliated with AFL-CIO

FLAGSTAFF, ARIZONA
86008

Tel: 602: 774-7222

86

1825 N. Main Street

November 8, 1975

Mr. Thomas Kleppe
Secretary of the Interior
Interior Building
Washington, D.C. 20240

Dear Mr. Kleppe:

Please consider this letter an endorsement by the Officers and Delegates of the Coconino-Navajo Counties Central Labor Council, Flagstaff, Arizona, to proceed with the Kaiparowits Power Project in Southern Utah.

It is our unanimous consensus of opinion that this undertaking will be beneficial not only to industry but will also afford job opportunities to our many unemployed people in the various fields of construction.

We feel very strongly that natural resources in the United States should be used to further our progress as an independent nation, for without progress a country cannot thrive.

Therefore, it is our intention to fully and wholeheartedly support the Kaiparowits Power Project both as individuals and as a Council, and we will appreciate your favorable consideration of the matter.

Sincerely yours,

William F. Carnell
William F. Carnell
President

WFC:dh

cc: Mr. Paul Howard
Bureau of Land Management
Salt Lake City, Ut.

085-1X-580



Local Union No. 184
United Brotherhood of Carpenters and Joiners of America

AFFILIATED WITH AFL-CIO
2262 SOUTH WEST TEMPLE

PHONE 467-7887



SALT LAKE CITY, UTAH 84115

November 11, 1975

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Mr. Paul Howard
Bureau of Land Management
Federal Building
Salt Lake City, Utah 84111

Dear Sir:

Please accept this letter as record of support for the immediate approval of the Kaiparowits Project. It is the consensus of the members and their families of this organization that approval of the project is of utmost importance both to the Nation and the State of Utah. We have the natural resources needed by the Nation, but also of prime importance to the State of Utah is the most important resource—people. For many years we have educated young women and men in our excellent schools and colleges only to find that they have to seek employment outside the state in order to support their families. We would hope you would consider this as a letter from local people in reference to a very critical decision.

We in Utah know of the pressures from outside groups to hold up the project, but we find it hard to continue to finance a vast playground for the few while not furnishing an economy in which our young people can work and prosper in their own state. Please consider that there is very little, if any, opposition to the project at the local level.

In view of this, we hope that speedy approval of the project will be forthcoming.

Our organization represents in excess of 2,000 members, including the area involved in the Kaiparowits Project.

Respectfully,

William S. Bailey

William S. Bailey
Special Representative
Carpenters Local 184
United Brotherhood of Carpenters
and Joiners of America

MSB/t
opetu-31

PRESIDENT
JOHN TEMARST
VICE PRESIDENT
ERIC HODMAN
SECRETARY-TREASURER
BUE MARIE YOUNG

DIRECTORS
JACK ADER
STEPHEN GORNBALL
BILL BEVO
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JACK B. PARSON
HAROLD PERSPACH
LOREN PUGH
CLIFF WOODLAND

UTAH CHAPTER-ASSOCIATED GENERAL CONTRACTORS

1136 South West Temple
P. O. Box 1048
Salt Lake City, Utah 84110



Area Code (801)
Telephone: 363-2753

November 10, 1975

88

HORACE J. GUNN
EXECUTIVE MANAGER

Bureau of Land Management
Federal Building
125 South State Street
Salt Lake City, Utah 84111

Gentlemen:

We would like to assure you of the support of the construction industry for the Kaiparowits Power Project.

The Utah Chapter of AGC encompasses some 350 firms which are made up of general contractors, subcontractors and suppliers of materials and services. We are one of the oldest trade associations in Utah.

We think this project is good for Southern Utah and for the state as a whole and surely endorse it.

Very truly yours,

ASSOCIATED GENERAL CONTRACTORS

Horace J. Gunn
Horace J. Gunn, Executive Manager
Utah Chapter

HJG:fp

November 7, 1975

Mr. Paul L. Howard, State Director
Bureau of Land Management
Department of the Interior
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

During the past year I have been away from Utah. Since I was unable to participate in the public hearing held on September 15, 1975, I am submitting my views of the Kaiparowits Draft Environmental Impact Statement at this time. I would like my letter to be made part of the official hearing record. Also, I wish that the article I have included with this letter be made part of the record, the article contains a great deal of information which is germane to the DES. It was published in the July issue of National Parks & Conservation Magazine.

Environmental impact statements describing power projects will continue to be meaningless bureaucratic exercises as long as reliable studies which examine the need for increased electrical energy are not an integral part of those statements and the decision-making process. Needless to say, those studies must be undertaken by independent investigators and not by utilities with vested interests or by biased federal agencies charged with facilitating the "best use" of our nation's energy resources.

The Kaiparowits EIS is deficient in that no studies are included which provide objective demand forecasts. Such a deficiency undermines the NEPA process. The publication of an incomplete EIS not only violates the law, but it is a blatant waste of taxpayer money. The NEPA requirement to examine alternatives to a proposal cannot be met by merely stating that "independent predictions of future demand would be useful in assessments of the impacts of proposed projects." The NEPA process has been used to justify the fact that there have been no studies made for the Kaiparowits market area. [DPS 1-40] In attempting to establish a need for a Kaiparowits powerplant, it is not only lamentable but very likely illegal to only publish demand forecasts submitted by the Kaiparowits electric utility.

No research was undertaken to determine the validity of that industry's claim that the accuracy of their forecasts can be empirically proven. At least once a year, with much hand-wringing before state public service commissions, utilities proclaim that the solution to a continuing exponential growth in demand is to construct as expeditiously as possible more and bigger powerplants. Paradoxically, these seemingly prudent forecasts are based on the same exponential growth model that has caused the case in point is Salt River Project's loss of heart less than two months prior to the publication of the Kaiparowits BSES. After many years as a participant in the Kaiparowits power consortium, Salt River Project found a cheaper source should they ever need that additional power. An examination of the differences between Salt River Project's 1973 and 1974 forecasts for 1985 peak demand may provide a clue. The difference between these two forecasts amounts to 174 mw, which is less than the total electric capacity of the county's largest utility, Salt River, during 1974, when their former partners also revised their forecasts for 1985. Southern California Edison found

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that its needs were decreased by 4,000 MW. That dramatic reduction is significantly more than the total amount of energy to be generated by a Kaiparowits powerplant. In fact, it is 3.3 times more megawatts than SCE has subscribed from the Kaiparowits contract. In 1974, the same year that the contract was signed, the California Public Powerplant for 1982, Likewise, San Diego Gas and Electric found that it needed 989 MW less in 1974 as compared to 1973, an amount representing 1.4 times as much as the Kaiparowits plant would generate. The DES also notes that the peak demand in 1985 has been reduced approximately 0.3 times the forecast peak demand for 1985 in 1973. Although the DES does not discuss the dramatic changes in demand forecasts occurring in 1974, it discusses those reductions in terms of percentages rather than in absolute number of megawatts. [DES 1-40] The three utilities which were able to compare forecasts made in 1974 with those formulated in 1973 found that 1985's peak demand had been reduced by 14.6 percent, which is almost twice the size of the proposed Kaiparowits plant. [DES 1-40] Instead of dwelling into the salient reasons for the dramatic changes in the forecasts, the DES merely connotes that the 1974 phenomenon is a result of the "unavailability of the pitfalls of forecasting." The DES shifts examination to the public awareness of the necessity to conserve energy and a nationwide reaction to a price-escalated demand situation.

Unfortunately, the DES may not fail to include impartial demand forecasts but it does fail to explain why utility forecasts are considered to be "inflated and self-serving," and why utilities minimize the importance of energy conservation and continue to press for more powerplants in spite of "the difficulty of financing new facilities and increasing costs of new generating capacity." [DES 8-9] The explanation is given regarding the structure and operating characteristics of the electric utility industry in order to clarify why it is inequitable to require that construction not cease. The DES is obliged to show that the role powerplant construction has in maintaining a viable electric utility industry. If privately owned utilities are to remain operative, they must continue to attract investors. In order to increase their rate of return, regulation which is set by a state public service commission, must allow them to increase their rate base (electric plants) and therefore, because the size of the rate base directly affects the rate of return, stockholders can realize healthy returns on their investments only if rate bases are increased. Powerplants need to be constructed if rate bases are to expand, thus, electric utility companies have no choice but their regulators and the public of the need for these plants. It is not surprising that those who oppose the forecast are often the center of controversy. The authors of the DES seem to be aware of the questionable reliability of utility forecasts:

Many who believe growth in energy consumption must be slowed maintain that utilities over estimate future demand in their forecasts, that forecasts are self-fulfilling & therefore, more generating capacity is installed and more energy consumed than is necessary to satisfy a 'reasonable' level of public need.

The irresponsibility of relying exclusively upon utility forecasts is heightened by the fact that not only does the BLM omit independently researched forecasts, but their consultants, the Federal Energy Administration, also fail to include unbiased forecasts in their report. Nevertheless, the FEA unabashedly recommends that:

there be forecasts compiled independently of those produced within the electric utility industry. Such forecasts would help to insure balance; they would lend greater credence to Government decisions permitting construction of generation and transmission

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facilities, and they would lead to more widespread participation in the economic planning process. The RIA is considering means by which independent forecasts might be encouraged. [DES A-133]

Not surprisingly, the RIA is silent regarding procedures such as the granting of federal contracts for the encouragement of producing independent forecasts. Perhaps in an effort to soften the impact of its omissions, the RIA obliquely acknowledges its failure to consider:

public policy options (e.g., restructuring of electric power rates or mandatory conservation) which would have a widespread impact on energy matters and, in so doing, affect the need for Kaiparowits and/or the merits of its alternatives. [DES A-73]

In spite of the fact that the "RIA sought information which could be used in preparation of the 'conservation alternatives' section of an Environmental Impact Statement," [DES A-75], the RIA declines to provide those impartial analyses although that agency is cognizant of the fact that "financial use could limit electric power demand to the point where new generating capacity would not be required." It seems unconscionable that the RIA glibly brushes off responsibility for investigating those possibilities by stating: "Discussion of the costs and benefits of public policies aimed at restricting electric power demand is beyond the scope of this report." [DES A-105] The DES is deficient precisely because it neglects to address important alternatives such as instituting energy conservation programs. It is not enough to admit "investment in conservation will lead to substantial monetary and energy savings." Neither is it sufficient to offer one example of a "system which provides economic and energy savings." The Kaiparowits Environmental Impact Statement must include energy conservation measures that are to be instituted prior to granting permission for the construction of that project since:

...the Kaiparowits utilities do not consider investment in conservation services to be a realistic alternative to investment in the proposed project...these utilities imply that, legal barriers notwithstanding, they do not consider large scale investment in energy conservation programs within the scope of their activities." [DES A-125]

To expect the utility industry to be responsible for massive energy conservation programs is as reasonable as expecting Dracula to judiciously administer the blood bank. Only federal and state governments can implement meaningful energy conservation policies because only they have the power to institute large scale programs which would redesign transportation systems, reduce the use of and recycle resources, promote use of energy efficient products, and control land-use.

Although the RIA refers to relying on information provided by the RWD Corporation [DES A-74], the DES does not reveal RWD's findings. Their research, prepared for the Resources Agency of California and California's State Assembly, with support from the National Science Foundation, found that California's electric demands could be reduced by two-thirds by the year 2000. Three years ago RWD recommended policies which would reduce California's growth rate from 8.5 percent to 3 percent.

The DES also fails to discuss the relevance of recent Federal Power Commission figures which show that total electricity sales for the nation increased only 0.5 percent from April 1974 to April 1975. The rationale for constructing a Kaiparowits power plant is based on a 6.8 percent growth rate.

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Environmental Defense Fund's testimony before California's Energy Resources Conservation and Development Commission needs to be made part of the DES's discussion regarding alternatives. That organization argues that if effective energy conservation policies were to be instituted, no additional electric generating facilities, beyond those already in existence or under construction, would be needed to supply California's electrical energy needs through 1984.

And finally, to quote from my article "Snoo Alert for Our Southwestern National Parks":

...an EPA consultant calculated that if the growth rate through 1990 were to fall by only one percentage point from industry projections of 7 percent annual growth, additional electric powerplants beyond a total of 10,000 respondents would prove to be unnecessary. [Source: Department of Interior, Southwest Energy Study]...and in April 1975, the San Diego Regional Coastline Commission rejected an application for an addition to a plant by San Diego Gas and Electric, a member of the Kaiparowits powerplant consortium, because that utility had overestimated growth in demand. [National Parks & Conservation Magazine, July 1975]

Commissioner Ronald Doctor of the California Energy Resources Conservation and Development Commission forecasts that energy conservation can reduce new powerplant construction by 50 percent to 70 percent and can reduce utility expenditures by \$6 billion to \$10 billion by 1984, in corp.

A month ago, former Secretary of the Interior Stewart Udall stated on a national broadcast of the American Issues Radio Forum that:

We've got to stop this simplistic thinking that we have to have all these powerplants. I was in California a week ago talking to the head of the State Energy Commission and his study showed that if Southern California did the sort of things it could do, using heat of the earth, using solar energy, and other solutions, that 75 percent of the proposed big electric powerplants that are enormously costly would not have to be built. [REB, October 4, 1975]

Two and one-half years ago, Secretary of the Interior Rogers C.P. Morton rejected the application for construction of a Kaiparowits powerplant because it "would impose severe additional impacts on this major recreation area." In making that decision, Morton stated:

The scenic beauty of its rugged Southwest landscape, coupled with the clarity of the air in the vicinity, are national assets of major importance, worthy of protection for the enjoyment of future generations of Americans.

Secretary Horton is not alone in his wish to preserve the unique quality of the area. As the DES points out, the proposed Kaiparowits project would endanger and perhaps destroy Utah's famed "sky-landscape relationship." The DES worries that:

If this visual pollution consistently drifts into the nationally and internationally important scenic areas such as Grand Canyon,

Rainbow Bridge, Lake Powell, Zion Canyon, Bryce, Arches, Canyonlands, etc., the effect on the panoramic viewing values could be catastrophic...there is enough evidence from the one unit operating at the Four Corners plants to cause grave doubts on the capability of clearing up the emissions to a point where they will not have a serious adverse visual effect.

Should a Kaiparowits power project be allowed to consume over 56,000 acre feet of water annually or is there a better use for our expensive Colorado River water in the parched Southwest? Is it worth risking an increase in Colorado River's salinity when each milligram-per-liter increase could inflict an estimated \$230,000 worth of damages per year? Is it worth increasing the mercury contamination of Lake Powell's sport fishery? The Lake Powell Research Project, supported by the National Science Foundation's Research Applied to National Needs program, found that the larger predatory fish of Lake Powell exceeded the Food and Drug Administration's mercury standard considered as safe for human consumption. Since safe-consumption levels are being exceeded, the research team estimated a mercury budget for the Upper Colorado River.

This budget suggests that from 1360 to 5440 kg of mercury may be released annually by natural weathering in the Basin, and that impoundment of the river may lead to the accumulation of approximately 800 kg of mercury in the lake system each year. Coal-fired power-generation developments may produce 4600 kg of mercury annually and, thus, may augment significantly the mercury released by natural weathering in the Basin. [Mercury in the Lake Powell Ecosystem, Stridford, Potter, & Klotz, Department of Biology, University of New Mexico, Albuquerque, New Mexico, June, 1973, p. 16.]

Is it worth spending over the land almost 6,000 tons of salt from the cooling towers every year?

Should the boilers of a Kaiparowits powerplant be allowed to burn a million barrels of oil a year or is there a better use for that fuel?

Is it worth destroying a unique local culture? Will an increase of 15,000 to 20,000 people, with values much different from those of isolated, rural Utah communities, cause moral degradation? Will the fabric of an unsophisticated peoples way-of-life be irreversibly shattered? Will a disrupted people be able to steadfastly continue to uphold precepts formulated by their recent ancestors, the area's first white settlers? The DES refers to maintaining "proper control" in order that Kane County not:

...experience a disproportionate crime rate and other problems similar...where boom town conditions caused a dramatic rise in divorces, arrests, public drunkenness, driving while intoxicated, and school drop outs.

But what is that proper control and is it worth it? Would it not be wiser to transport the coal to the load center? If a need for that power materializes, is it not better that we trust in technology to find a better method for meeting emission standards in the metropolitan areas of Arizona and California, and to recycle water in those areas? Rather than allow the residents of the market area to export their pollution, would it not be more just if the consumers of that power bear the full environmental costs of producing their electrical energy? Is it not unconscionable to ..

unfairly burden a people who, for the most part, have endured an odious existence? Should these people shoulder the societal responsibility of subsidizing a more materially fortunate segment of our population? To destroy the Southern Utah's clean air and water is not only unjust but an outrage that will likely not be forgotten.

Sincerely yours,

Marga Raskin

Marga Raskin

SMOG ALERT for our southwestern national parks

Proposed industrialization of southern Utah would pollute the
Southwest to provide power for distant cities

by MARGA-RASKIN

IN BRYCE CANYON National Park in southern Utah a group of men holding binoculars are silhouetted against a deep pink sky streaked by a few grey clouds. Bryce Canyon's superintendent, the Bureau of Land Management's district manager, and other federal officials peer intently across a darkening plateau thirty miles away and three thousand feet below, watching for an orange and black helicopter equipped with a single strobe light. Southern California Edison, project manager for the proposed Kaiparowits powerplant, is conducting an experiment. If that group huddled on the precipice can see the helicopter land, it will mean that the huge powerplant with many strobe lights on its four pollution-belching smokestacks, proposed to be built on Fourmile Bench sixteen miles north of Glen Canyon City, will also be visible from Bryce Canyon's scenic overlooks along the canyon rim drive. As the helicopter landed, Bryce Canyon Superintendent Chuck Budge could clearly see the strobe lights, while others in the group needed binoculars.

Earlier in the day at Inspiration Point overlook there had been many groups of visitors, some of whom knew that the world's largest coal-fired powerplant might be built on the Kaiparowits Plateau below. They, too, were concerned about the grave possibility that the vistas had impressed them and

millions of other tourists would be drastically diminished.

The more one learns about the 3,000-megawatt Kaiparowits powerplant, the more ill-conceived the project seems. Consider these facts: Southern California Edison Company, San Diego Gas & Electric Company, and Arizona Public Service Company will draw on at least 81.4 percent of the power output of the Kaiparowits plant. This means, in effect, that the integrity of one of this country's most beautiful natural areas, most of which is publicly owned, is being sacrificed for Utah's short-term economic gain and to provide power for Southern California and Central Arizona—and at a time when use of electricity in Southern California and Arizona has decreased since 1973 to such an extent that the need for that power is questionable. The energy and natural resources required to produce this exported energy are 24,730 tons of coal and 1,500 acre-feet of water per day and 1,000,000 barrels of fuel oil per year for the first five years.

The Kaiparowits plant will consume and evaporate Utah's share of critical Colorado River water supplies, and salt deposited by moisture from the plant's cooling towers will kill or stunt vegetation on 19,000 acres around the plant. In addition, the plant will produce noise, dust, smoke, haw lands, pipelines, high-voltage electrical

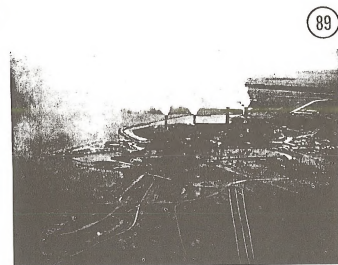
transmission lines, coal mines, limestone and gravel quarries, ash disposal dumps, new housing developments, more than 100,000 tons of air pollutants each year, and general social disruption from an influx of thousands of employees that will more than triple the population of the country.

Yet the proposed Kaiparowits powerplant is only one aspect of a much larger threat, even more shocking is the proposed intensive development of a large and scenic region of the Southwest by the construction of a whole series of giant coal-fired powerplants.

The Four Corners powerplant in northwestern New Mexico, the first in the series and fueled by the world's largest strip mine, has become known as one of the world's worst polluters. Its stack emissions caused a fivefold decrease in visibility in the area, frequently eliminating the view of sacred Indian landmarks such as Shiprock. The haze stretched a hundred and fifty miles southwest to Los Alamos, an equal distance north into Colorado, and seventy miles southwest into Arizona. Before wet scrubbers were installed, the amount of sulfur dioxide and fly ash being dumped into the area exceeded Los Angeles' total output of pollutants.

The Four Corners and San Juan plants in northern New Mexico and the Mohave plant in southern Nevada are already generating a total of more than 4,000 mega-

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Four Corners powerplant

89

Kaiparowits Draft Environmental Impact Statement, Bureau of Land Management

"By far the most severe impact in the study area and conceivably to the entire region is the visual pollution created by smoke and other airborne particulates emitted from the plant. In spite of the great effort put forth at the Navajo Plant to reduce these emissions, there is a definite plume or dark cloud drifting on a horizontal plane for many miles from just the one generator unit. When the two remaining units at the Navajo Plant and the four units at the proposed Kaiparowits Plant are operational, a permanent haze could be created which would significantly reduce visibility and have a devastating effect on the skyline/landscape relationship as well as obscuring many of the geologic formations which are important for the total scene of this area. If this visual pollution consistently drifts into the nationally and internationally important scenic areas such as Grand Canyon, Rainbow Bridge, Lake Powell, Zion Canyon, Bryce Canyon, Arches, Canyonlands, etc., the effect on the panoramic viewing values could be catastrophic. There is inadequate scientific evidence to prove or disprove the magnitude of the smoke problem (i.e. the intensity of the emission, where and how far it will drift, etc.), but there is enough evidence from the one unit operating at the Navajo Generating Station and the units operating at the Four Corners Generating Plants to cast grave doubts on the capability of cleaning up the emissions to a point where they will not have a serious adverse visual effect."

watts, and last summer the Huntington Canyon plant in Utah and the Navajo plant in northern Arizona began producing an additional 1,180 megawatts, bringing the total to almost 6,000 megawatts. A power consortium led by a Utah association of municipal utilities is planning to construct another huge powerplant near Caineville, Utah; only ten miles east of Capitol Reef National Park to supply power mainly for the Los Angeles Basin. Nevada Power Company is promoting a powerplant in the Warner Valley near St. George, Utah; twenty-three miles upwind from Zion National Park, with three-fourths of the output to be consumed by Las Vegas. Additional giant plants are planned for central Utah and the Escalante River area. Under one proposal water for the Escalante plant would be provided by damming the Escalante River, thus creating an artificial reservoir in the North Escalante Canyon Outstanding Natural Area, which is *de facto* wilderness. Such a reservoir would drown all hope for official wilderness designation there.

Utah Power and Light Company is expanding its Huntington Canyon plant and planning to construct another near Emery, a few miles south of Huntington. The Cholla powerplant near Petrified Forest National Park in Arizona is to be increased fivefold, and the Salt River Project is proposing to construct the 1,050 megawatt Coronado powerplant southeast of Petrified Forest National Park. In addition, El Paso Natural Gas Company and Western Gasification Company (WESCO) are proposing the construction of six coal-gasification plants on Navajo Indian land in New Mexico not far from the Four Corners and San Juan powerplants. El Paso is also contemplating the construction of a coal-gasification plant on the Kaiparowits Plateau.

For the past decade, the coal and utility industries have been surveying the millions of tons of stripable coal in the Altun coal field, which forms a horseshoe

around the southern border of Bryce Canyon National Park, and the billions of tons that could be mined from the Kaiparowits Plateau. Resources Company, Peabody Coal Company, Consolidation Coal Company, and El Paso have leased 107,450 acres of federal land on the Kaiparowits. An area abutting the eastern border of Capitol Reef National Park is also being considered for a strip mine.

Utilities and their subsidiaries plan to provide cheap power from nine-month electric generating stations for Phoenix, Tucson, Las Vegas, San Diego, and the Los Angeles area, even though it has been shown that the costs would be identical if the coal were shipped to the point of use for electrical generation in a metropolitan center. If the latter alternative were adopted, the consumer of that electricity would share the environmental costs. However, the plants could not meet Los Angeles air quality requirements, so the utilities escape regulation by California by burning the coal at mine-mouth in Utah, which does not have strict regulations.

Rugged terrain and a lack of water have kept the Colorado River Plateau from being developed as quickly as other sections of the nation. After the area had been overgrazed and eroded, federal and state governments fostered tourism in an effort to aid local communities. Now the rush to national energy independence is shifting priorities from environmental quality to energy production—and Utah is eager to cash in. Because southern Utah is "economically underdeveloped," it is susceptible to promises of economic growth and schemes for quick exploitation of its resources. By 1990 utility companies hope to be exporting more than 30,000 megawatts from the region—presently one of this country's most wild, fragile, and spectacular scenic areas.

WITHIN a 200-mile radius of Kaiparowits are eight national parks, twenty-six national monuments, three national recrea-

tion areas, two national historic sites, and one national memorial. This concentration of National Park System units comprises one-fifth of the total Park System acreage. In addition, there are spectacular Monument Valley in Navajo Tribal Park and the sacred Indian landmarks Navajo Mountain and Shiprock, as well as four national forests, numerous properties included in the National Register of Historic Places, and a vast expanse of lands under Bureau of Land Management administration. There are BLM's Paria Canyon Primitive Area, and Hackberry Canyon, Cockscomb Ridge, and Canaan Mountain—the latter three proposed for BLM primitive area designation. And there are the lush canyons of the Escalante River—with their series of waterfalls, flowered slopes, arches, and natural bridges that provide a cool green contrast to the southern Utah desert—which are under study for wilderness designation.

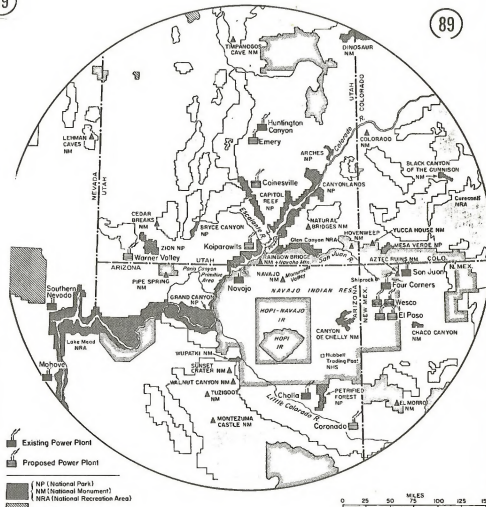
Joe Kennedy, Assistant Superintendent of the Glen Canyon Na-

tional Recreation Area, is concerned about the existing Navajo powerplant's effect on regional air quality between Lake Powell's Wahweap Marina and Rainbow Bridge National Monument. Kennedy takes some comfort in the fact that temperature inversions, which cause concentrations of pollutants, occur mainly in the wintertime when the least number of visitors is present. Although meteorologists are not able to predict how severely pollutants will affect air quality in the vicinity, they do agree that the recreation area will be affected by the Navajo and Kaiparowits plants.

Bryce Canyon Superintendent Budge worries that even the slightest reduction in visibility will have a detrimental effect on visitors' experiences in the park. The Navajo powerplant, sixty miles away on the Arizona side of Lake Powell, already intrudes on the area's beauty and magnificent vistas. Pollutants from the Four Corners powerplant in northwestern New Mexico, as traced by infrared pho-



Light green Indian rice grass, Mormon tea, violet lupines, bright orange globe-mallows, and delicate white primroses grow in the red sand at the foot of silvery transmission towers that march across the desert from the Navajo coal-fired powerplant at Page, Arizona. The intrusion evokes a primitive, mystical feeling that makes one wonder if this is one of those ominous symbols referred to by the ancient Hopi prediction of man's demise should he destroy the land held sacred by that tribe for more than a millennium. Already smog hangs over Lake Powell in the background.



APPROXIMATE LOCATIONS OF SOUTHWEST POWERPLANTS (1975)

FEDERAL COURTESY

One-fifth of the National Park System is located in the region of the proposed powerplant complex

topography, reach Bryce two hundred miles away.

Because prevailing winds at Bryce are from the southeast approximately one-fifth of the time, pollutants produced at the Kaiparowits powerplant combined with those produced at the Navajo powerplant can be expected to have an increasingly adverse effect not only on the visitor's experience but on wildlife, vegetation, and climatic conditions there as well as other downwind areas. Scientists are studying the effects of energy development on ecosystems within a 100-mile radius of the Four Corners plant in an attempt to obtain hard data.

Capitol Reef National Park Superintendent Franklin Wallace feels that "there's a good possibility that emissions from the Kaiparowits would be sucked up the Strike Valley of the Waterpocket Fold." Wallace recalls that even now, "at certain times of the year, when the clear blue sky that prevails at Capitol Reef is overlaid with a heavy layer of smog, the Four Corners powerplant is suspected of being the culprit."

Park naturalist David May at Canyonlands National Park, a bit east of Capitol Reef, reports that twice during the past four years a reddish-yellow haze decreased visibility from Grand View Point, obscuring the vista of the nearby snow-capped La Sal Mountains. May suspects that the "floating garbage" originated at the Four Corners powerplant.

Keith T. Pfeiffer, supervisor of the Kaibab National Forest, which adjoins Grand Canyon National Park on the north and south, hopes that prevailing winds will prevent smoke and haze from the powerplants from drifting southwest into that area. Pfeiffer predicts that Kaibab's visibility, now one hundred miles or better, "will be re-

duced substantially when the winds blow from the northeast."

IN RESPONSE to growing concern over the future of the scenic and recreational resources of the Southwest, in 1971 the Senate Interior and Insular Affairs Committee held hearings in Albuquerque, New Mexico, Las Vegas, Nevada, Salt Lake City (Utah), Durango, Colorado, and Page, Arizona. The voluminous testimony pinpointed the basic problem: too many decisions have been made "to achieve limited and relatively short-term goals and which often were made without full knowledge or adequate consideration of the full range of alternatives, the potential regional impacts, or the long-range desirability of the actions involved."

The Senate hearings brought forth a variety of objections to the proposed power developments by authoritative and vocal adversaries. Before the hearings had concluded, then Secretary of the Interior Rogers Morton hastily announced that the Department of the Interior would also undertake an extensive review of the situation and report its findings within a year. As manager of the federal coal resources and as trustee of the Indians' coal resources, Interior's goal was "to develop an information base and public dialogue to guide decisions and identify the information and alternatives required to facilitate future decisions involving long-term choices."

It soon became apparent that Interior's resulting *Southwest Energy Study* was essentially a justification for the construction of powerplants inasmuch as it minimized or ignored their damaging effects on the environment. Certain experts at Interior predict that power-related developments will have a profoundly devastating and irre-

versible impact on the environment of the Southwest. However, Indians and environmental organizations have failed in their efforts to force Interior to comply with the National Environmental Policy Act (NEPA) by preparing an environmental impact statement on the entire Southwest energy complex—instead of piecemeal, plant by plant.

The NEPA process presents an opportunity to study the seldom discussed economic and social costs of energy development—such as the need to construct roads, schools, and medical facilities and disruption of other means of livelihood such as grazing.

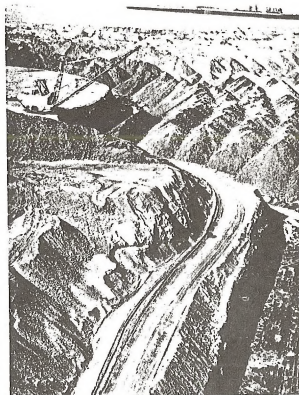
The Environmental Protection Agency (EPA) is afraid to move decisively to protect the air quality of the Southwest and has side-stepped its responsibility under the Clean Air Act by letting states decide for themselves the amount of significant deterioration of air quality (if any) they will allow within their borders. In the case of federal lands such as national parks, the Interior Department is empowered to place such in the most pristine classification, but so far it has not acted.

The National Park Service Organic Act, authorized by Congress in 1916 "to conserve the scenery, the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such a manner and by such means as will leave them unimpaired for the enjoyment of future generations," provides another tool that could be used to protect the parks of the Southwest. Thus, a number of laws exist to prevent the unique and superb environment of the Southwest from being degraded, but whether they will be implemented by the responsible agencies is another question.

The rationale for constructing

the Southwest powerplants is based on phenomenal growth patterns of the recent past in California and Arizona. However, an EPA consultant calculated that if the growth rate through 1990 were to fall by only one percentage point from industry projections of 7 percent annual growth, additional powerplants beyond a total of 10,000 megawatts would prove to be unnecessary. In the past two years there was a significant reduction in consumption in that area, and in April 1975, the San Diego Regional Coastal Commission rejected an application for an addition to a plant by San Diego Gas and Electric, a member of the Kaiparowits powerplant consortium, because that utility had overestimated growth in demand.

WHEN I think of the Southwest, I recall magnificent views of red rock and clear azure sky, lichens colored fluorescent green, metallic grey, and sulfurous yellow, agave which blooms only once in a decade to produce a tall yellow-flowered spike that continues to stand long after the plant has died, purple flowers of leucocedrus and the strong fragrance of sage, grasses bent by a breeze etching semicircular tracks, and delicate footprints of tiny lizards, beetles, and kangaroo rats imprinted on red sand freshly sculp-



Navajo strip mine, with Four Corners plant in background

Many Indians object to leasing their land for strip mines—

"The white man, through his insensitivity to the way of Nature, has desecrated the face of Mother Earth. The white man's desire for material possessions and power has blinded him to the pain he has caused Mother Earth by his quest for what he calls natural resources. And the pain of the Great Spirit has become difficult to see by almost all men, even by many Indians who have chosen instead to follow the path of the white man."

"Today the sacred lands where the Hopi live are being desecrated by men who seek coal and water from our soil that they may create more power for the white man's cities. This must not be allowed to continue for if it does, Mother Nature will react in such a way that almost all men will suffer the end of life as they now know it. The Great Spirit said not to allow this to happen even as it was prophesied to our ancestors."

—From letter to President Nixon from the Hopi Traditional Village Leaders, 1970, when the Peabody Coal Company began stripping coal from lands leased from the Hopi and Navajo tribes. Peabody Coal Company officials had promised that mining would not damage the land and would improve the lives of the Hopi and Navajo.



tured by the winds to resemble ripple marks of a receding tide. This magnificent country can heal a weary spirit. But will a visitor in twenty years be greeted by smokestacks, power lines, and a smoggy view from scenic overlooks like the ones at Bryce Canyon?

The national parks, monuments, landmarks, and recreation areas of the Southwest are financed with taxpayers' money, which means that we all have a proprietary interest in them as well as an interest in their natural beauty. The construction of powerplants in an area that includes so many national treasures is not a matter that concerns just the state of Utah and the power-consuming states of the West. It concerns all of us. When a powerplant ruins the vistas of a national park or monument, worsens the quality of pristine air, and scars public land, the investment we have made in our public natural areas is devalued—an investment intended to preserve some of the country's most beautiful and wild land for generations to come.

What will be our legacy to those who follow us?

For the past three years Marga Rasnik has been lecturing, testifying, writing, and participating in panel discussions concerning various environmental problems, especially as they pertain to powerplants and air quality.



LAKE M. J. PHOTOGRAPH

Editor's Note

INTERIOR PROCRASTINATES OVER CLEAN AIR FOR OUR PARKS

The Clean Air Act of 1970 has the potential to safeguard our public lands in the Southwest, as well as in the entire nation, from air pollution, but the Act has not been properly enforced by the federal government. A 1973 Supreme Court decision bound EPA to implement regulations that would "prevent significant deterioration" of air quality in areas where the air is now cleaner than required by national standards established by the Act. However, "significant deterioration" was not defined by the courts or Congress.

Late in 1974 EPA avoided responsibility for its definition by issuing regulations that allow the states to decide for themselves the amount of significant deterioration allowable within their borders. EPA proposed that the states classify areas in which existing air quality is better than national standards into three categories: Class I—areas where no change (deterioration) is allowed; Class II—areas where some change in air quality is permitted within certain set limits; Class III—areas where deterioration is permitted down to the national standard to allow industrial and other growth. Classifications do not have to conform to existing air quality in an area, so an area of pure air quality could be designated as Class III by a state. Although decisions must meet EPA approval, the only criterion required is consideration by the states of relevant environmental, social, and economic factors.

NPCA protested at the time EPA issued these regulations that they sidestep the intent of the Clean Air Act and that the federal government should set standards that promote uniform air quality controls. This Association stressed that EPA policy should include protection or improvement (when necessary) of the pristine air quality within and surrounding national parks and other nationally protected areas.

Under the present regulations, that would mean a Class I designation.

Although NPCA considers present regulations inadequate, there is a mechanism that could provide for Class I designation of lands within national park units and other areas. Right now these areas are designated Class II as the result of an EPA regulation issued on January 4, 1975, that designated all areas in the nation as Class II pending federal or state applications for reclassification. In order to reclassify an area as Class I or Class III, a state or federal agency must apply to EPA, which has the final authority. In the case of a national park unit, the National Park Service, acting through the park superintendents, apply to EPA for reclassification; EPA will not initiate any reclassifications.

States could leave lands adjacent to federal lands as Class II or apply to reclassify them as Class III, a designation permitting a concentration of large powerplants. (Even the present Class II designation perhaps would permit 1,000 megawatt plants at twenty-five-mile intervals.) It can only be hoped that through EPA or through the public hearing process and regulations concerning transport of air pollution, such moves would be suppressed.

It is alarming that, as of press time, no action has been taken by the Department of the Interior for reclassification of national parks or other nationally protected areas as Class I.

Concerned readers should write Assistant Secretary of the Interior Nathaniel P. Reed (Department of the Interior, Washington, D.C. 20240) to urge that the federal government designate all national parks and monuments, national wildlife refuges, and national wild and scenic rivers as Class I (no deterioration).

To: Kaiparovits EIS Team

5 Nov. 1975

From: Ben Wood, Director of Navajo-Kaiparovits Environmental Baseline Studies, Brigham Young University, Provo, Utah

Re: Comments on Draft of EIS

The summary statement will probably be the principal document of the Impact Statement read and referred to by most readers. Therefore I would like to make some comments on a few statements therein.

Limestone Quarry

The statement (pg II-3) regarding the vegetation indicates ground water is misleading. The dominate vegetation is shrub-grass, shrubs, or trees which are not indicators of moisture. Big rabbitbrush is found in some of the drainages. This species requires more moisture and is found principally where intermittent streams flow.

The statement (pg II-4) regarding the location of the prairie dog towns is also misleading. There are some towns in section 22 of T 34S R3W (SL B&N) where some claims are located, but the area of primary concern and apparently where the highest quantity and quality limestone is located in sections 11, 12, 13 and 14 of T 34S R3W (SL B&N). There are no old or active prairie dog towns in this area. And since the proposed quarry area is small, roads, power lines, etc, required to service the area and the haul roads can be constructed to avoid any impact to the prairie dog town, or any other wildlife species.

The vegetation of the proposed quarry site is dominated by juniper, pinyon, ponderosa pine, and bristlecone pine. The stands of juniper and pinyon, average about 100 years old and the bristlecone and ponderosa pine average about 360 years old. In my opinion this forest is much younger than that within Bryce Canyon National Park. The bristlecone pine is vigorous and has several age classes represented in every stand I have sampled. Therefore I view this area as one being dominated by a regenerating forest, which could withstand some disturbance. Because the total area to be impacted by the mining processes will probably be less than 500 acres, and because the impact on the forest will not occur all at once, portions of the areas can be rehabilitated as they are no longer needed. Trees of the surrounding areas can be used as sources of seed because they are old enough to produce good seed.

Soils

The extent of each kind of soil could be inferred from the vegetation and could be included in the summary (pg II-2)

Reference to two soil associations is found under Ecological Interrelationships but not under the soils section.

Vegetation

There is a wide variety of successional stages in the Kaiparovits Region is probably true (pg II-3), but there are probably not sufficient data to substantiate this. Most work done in this region has been in pristine or assumed pristine areas. From the Navajo-Kaiparovits Environmental Baseline Studies, we have documented two or three stages on disturbed areas in the pinyon-juniper communities; they are the Russian thistle stage, broom snakeweed stage, and globemallow stage. It is not known what the relationship these have to each other or the probable time period required by each. Nevertheless the Russian thistle and snakeweed stages are most commonly found on highly disturbed sites.

Snakeweed is essentially unpalatable to small mammals during the growing season and possibly somewhat poisonous to deer mice in the late fall. Russian thistle and globemallow are palatable in both summer and fall. These results have been obtained from studies still in progress at BYU.

More studies are required before the dynamics of succession can be evaluated. Most of our knowledge covering succession in the Kaiparovits area is limited to the higher benchlands; little is known about the successional patterns on the lower benchlands such as Nipple Bench. Our research has indicated that there are perhaps four to six basic vegetation units below the pinyon-juniper zone; the relationships within the shadscale types are the least known.

Wildlife

Something should be said concerning the status of the transplanted antelope herd. The transplant was largely unsuccessful. A pair of antelope were seen near Nipple Spring during September 1975, but to my knowledge these are the only ones left.

The deer herd on Four Mile Bench has drastically declined from 1972 to 1975. In 1975 it was only 16 percent of the 1972 population. (See attached paper on animal pathology for details on health and vigor of jackrabbit and deer populations).

Ecological Interrelationships

Herbaceous species are abundant or productive only in years of adequate moisture. Since moist years occur less frequently than dry years, the amount of herbaceous plants is more variable from year to year than that of the shrubs. Consequently the cattle are forced to forage mainly on woody species. This is particularly true for those grazing Four Mile Bench which

is dominated by a mature, old, perhaps climax, piñon-juniper forest. The understory conspicuously lacks an herbaceous understory. The vegetation responds to precipitation in the following manner:

x = precipitation from July through June
 y = parameter to be estimated
 $y = 0.81X + 32.30$ Number of Species
 $y = 0.36X + 76.11$ Total percent cover
 $y = 0.97X + 0.84$ Composition of Shrubs
 $y = -0.09X + 1.43$ Composition of non-woody perennials
 $y = -0.99 + 98.16$ Composition of trees

The composition of annuals has been too low to obtain data from which a predictive equation could be calculated.

Therefore there is intense competition between cattle and deer for the same forage resources. This competition is compounded by the fact that rodents and lagomorphs consume one third to one half of the current annual growth of the herbaceous plants. The herbaceous species are most often found along roads and similar disturbed areas, and in the sagebrush communities. This forces the cattle to browse species even in the sagebrush communities (these represent approximately eleven percent of Four Mile Bench) which are also prime habitat for deer. The net result is that cattle grazing on Four Mile Bench is ecologically unsound.

EC X 10^3 of 1.1 as stated on pg III-74 - Environmental Impacts

(See attached paper)

I believe the interpretations of the effects of salt deposition are based upon the above value of $1.1 \text{ EC} \times 10^3$. The draft statement is less clear than the initial drafts that I was able to review in February, 1975.

Impact of Elements

Most discussions involving heavy or toxic elements and/or compounds usually are based on the worst situation or the least likely situation depending upon which side of the fence you are. Seldom is the likelihood of occurrence of either situation presented. Consequently the practical everyday situations are avoided. This is especially true for mercury in terrestrial ecosystems. Most studies evaluating this element in terrestrial systems have concluded that it does not appear that an environmental problem exists in higher plant life in terms of mercury.

There is a lack of knowledge that relates the terrestrial to the biotic system. This is cause for concern and should require

¹Krenkel, F. A., R. S. Reimers, and W. D. Burrows. 1973. Mechanisms of mercury transformation in bottom sediments. Part 1. Technical Report Number 31. Environmental and Water Resource Engineering Vanderbilt Univ., Nashville, Tennessee.

some intensive research. Our present knowledge of mercury indicates that this element does not accumulate in terrestrial systems but is biologically amplified in the aquatic. Will mercury from a coal-fired generating station be directly deposited into an aquatic system? Based upon our knowledge of terrestrial systems inorganic mercury will not accumulate in terrestrial plants or soils, nor will organic mercury accumulate in such because methylation occurs only to a limited extent in plants and soils. Any potential adverse effect from mercury would then have to be in the aquatic systems which probably receive mercury supplies via plant debris from the terrestrial sites or the mud and silt deposits washed in by flooding from the terrestrial sites. The following items from the research of Krenkel, Reimers, and Burrows (loc. cit.) are pertinent to the evaluation of mercury in the environment and should be considered for the final draft of the impact statement:

1. Prevailing methods of analysis were inadequate for reproducible, precise determinations of mercury concentrations. This is especially true for analyses of fish flesh.
2. Methylmercury probably constitutes less than one-half of the total mercury burden found in organisms, especially fish flesh.
3. Bottom sediments rich in organic matter and higher temperatures increase the rate of conversion of inorganic mercury into methylmercury.
4. Clay and sand substrates tend to inhibit methylation.
5. Uptake of mercury by fish is proportional to the initial concentration in water.
6. New sediments entering a reservoir will seal off existing sediments. If the new sediments are mercury-free, sedimentation will decrease the amount of mercury entering aquatic ecosystems.

Also included with my comments is our paper on the vegetation of the Katoowits Region. Within the next two weeks I hope to be able to send you a copy of our summary of most of the first three years of data.

Thank you for considering my comments.

BW/jc

CHAPTER VIII-1

Soil Salinity Measurements and Interpretations:
A Technical Note

B. W. Wood and J. R. Murdock

Much of the soil salinity data reported in the literature are based on resistance measurements determined with the Wheatstone Bridge (Harris, 1920). Resistance data are influenced by soil texture, saturation percentage of the soil, and kinds of ions present (USDA 1954; Buckman and Brady 1969). Figures VIII-1.1, .2 and .3 present data which show the influence of different ions on resistance. Resistance readings of the various sandy textured soils from the Kaiparowits Basin are somewhat higher than those for NaCl or KCl solutions (Figure VIII-1.3). Some of the heavier textured soils tend to be similar to the $\text{CaSO}_4 + \text{KCl} + \text{NaCl}$ curve (Figure VIII-1.2).

There seems to be agreement that conductivity is the better way to express salinity measurements (USDA, 1954). Many wheatstone bridges have conductivity cups, but data obtained with such cups are merely the reciprocal (mhos) of the resistance (ohms). These data are not directly correlated with the conductivity data (millimhos/cm) which are usually reported for saturation extracts or for water. Data which correlate resistance and conductivity (millimhos/cm) are meager, especially for higher resistance readings. Data from page 351 of the Soil Survey Manual USDA, 1951 are examples of such data:

Conductivity millimhos/cm at 25° C. ($\text{EC} \times 10^3$)	Resistance ohms at 60°	ppm of salt	Percent salt
3.0	380	500	0.050
4.0	295	600	0.060

The following conditions apply to the above data:

- soil saturation is 20 percent on oven dry weight of soil
- conductivity is of saturation extract
- resistance is of saturated paste

Thorne and Thorne (1951) proposed the following equation to relate resistance to conductivity: $\text{ppm salt as determined by resistance} \div 0.7 = \text{EC} \times 10^6$.

This relationship seems to hold true for water or saturation extracts, but not for saturated soil pastes. Some soil scientists, by trial and error, have proposed that 0.5 is a better factor than 0.7 for saturated soil pastes. The Salinity Laboratory (USDA, 1954) reports that conductivity can be expressed as $\text{EC} \times 10^3 = \frac{\text{ppm of salt}}{(10000) (0.064)}$.

However this equation is also best suited for saturation extracts.

There is a need to correlate resistance (ohms) and conductivity (millimhos/cm) of saturated soil pastes. The data from the Soil Survey Manual, and salinity determinations of soils from the Kaiparowits Basin were used as the basis to derive the information presented in Fig. VIII-1.4. It was found that resistance readings may be higher than 8000 ohm for water extracts from quartz sand. The maximum for the soils analyzed approached 4000 ohms.

Conductivity is influenced by KCl and NaCl as indicated by the

following data:

ppm of KC1	Ohms	EC x 10 ³
600	295	4.0
500	350	3.2
400	390	2.9
300	505	2.3
200	750	1.6
100	1550	0.8
50	2750	0.2
25	3350	0.14
10	3700	0.07
5	3850	0.01

ppm of NaCl	Ohms	EC x 10 ³
600	295	4.0
500	380	3.0
400	485	2.3
300	635	1.8
200	865	1.0
100	1435	0.6
50	2785	0.2
25	3360	0.14
10	3750	0.08
5	3850	0.01

For convenience, a comparison of the data for 1 millimhos/cm are tabulated below:

	ohms	ppm salt
Soils Experiments	708	285
KC1 solution	1350	125
NaCl solution	865	200

The average salinity of the sandy soils from the Kaiparowits Basin is approximately 228 ppm. This value is used below to calculate conductivity using the various factors which have been proposed.

$$a. \quad \frac{228}{0.7} = \frac{EC \times 10^6}{326} \quad \text{or} \quad \frac{EC \times 10^3}{0.326}$$

$$b. \quad \frac{228}{0.5} = 456 \quad \text{or} \quad 0.456$$

$$c. \quad \frac{228}{(1000) (0.064)} = 0.356$$

d. (from soils data)

$$\frac{228}{x} = 0.580$$

$$\text{therefore } x = 393 \text{ or } (10000) (0.0393)$$

The relationship between resistance and conductivity data of the soils studied is higher than that estimated using equations which are adequate for soil saturation extracts or water. The factors relating these kinds of data probably vary so much that an overall constant could not be derived for soils of the Kaiparowits Basin.

The reason that the relationship of resistance to conductivity was investigated is that the BLM has implied that the conductivity of the soils considered above is 1.1×10^3 millimhos/cm. This value is 47% higher than the value reported herein.

The factor used by BLM personnel to derive 1.1×10^3 millimhos/cm was approximately 100, e.g. $228 = 1.14$. This relationship would be valid if the maximum resistance value of the soil approached 10,000 ohms. Resistance values approaching 10,000 ohms are achieved only with distilled water and perhaps nearly pure limestone. It is unlikely that these conditions are found in the soils studied from the Kaiparowits Basin. Examination of Fig. VIII-1.3 indicates that a combination of soluble and insoluble solutes are probably involved.

It was proposed by the BLM in a draft of EIS for the proposed generating station that the baseline conductivity (as calculated using a factor of 200) is high enough that salt effluents could markedly reduce plant cover. This was in particular reference to the limestone processing facility associated with the proposed Kaiparowits Generating Station.

Reference was made to a study reported by Gates et al. (1956) to substantiate this hypothesis. However, this study was an investigation to evaluate the effects of parent materials on distribution of plant communities. Therefore, detailed studies were not carried out to investigate salt tolerance of the component species. Hence, the levels of salinity predicted in this study to limit plants can be interpreted only on the basis of the community in which they grow and not on the basis of individual species.

On the other hand, Freeman and Harper (no date) found that most salt tolerant plants, especially those of the goosefoot family (*Chenopodiaceae*) can grow in soils having conductivity values of 20-40 millimhos/cm. Some plants such as samphire (*Salicornia* spp.) grow in soils whose surface layer, i.e. 0-1" deep, has conductivity values as high as 196 millimhos/cm. It is concluded that even if the baseline conductivity were to become as high as stated in the EIS, it is unlikely that the vegetation types within the Kaiparowits Basin will be substantially altered because of salt effluents. This is true because approximately 40% of the area is dominated by chenopods. The data evaluated herein are more typical of the remaining vegetation types whose constituent species are adapted to some salt in the soil, i.e. 4-8 millimhos/cm (See Fig. VIII-1.5). Therefore at least 40% of the area is already dominated by plants which can tolerate at least moderate amounts of salts.

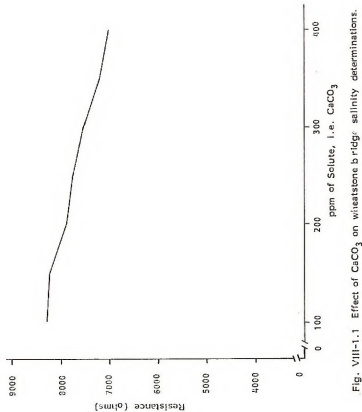


Fig. VIII-1.1 Effect of CaCO_3 on Winitstone b ridge salinity determinations.

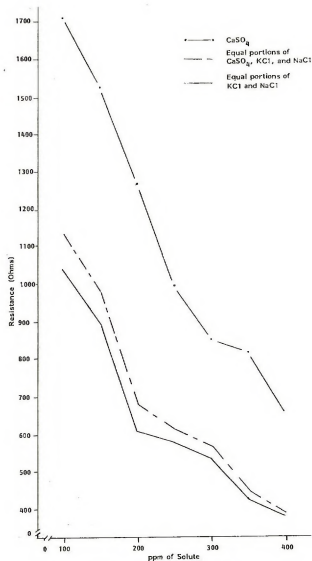


Fig. VIII-1.2. Effects of Various Solutes on Wheatstone Bridge Salinity Determinations

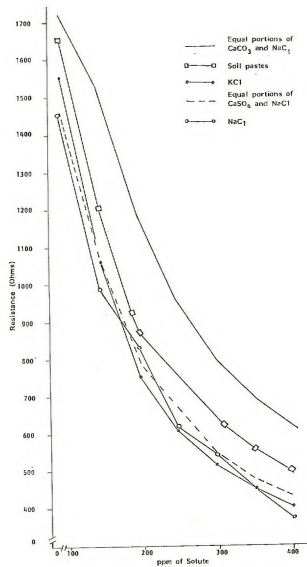


Fig. VIII-1.3. Effects of Various Solutes on Wheatstone Bridge Salinity Determinations

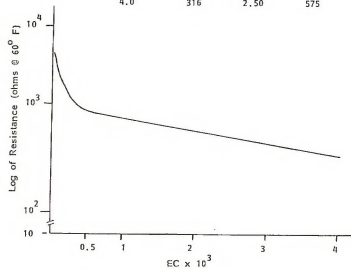


Fig. VIII-1.4. Correlation of conductivity (millimhos/cm) resistance readings (ohms) of saturated soil paste.

EC x 10 ³	Ohms	Log of ohms	ppm of salt
0.1	1995	3.30	85
0.2	1259	3.10	145
0.3	1000	3.00	180
0.5	832	2.92	215
0.7	759	2.88	248
0.8	724	2.86	272
1.0	708	2.85	285
3.0	371	2.57	510
4.0	316	2.50	575

Site No.	Resistance Ohms	Temp ohms °F @ 60° F	ppm of salt	Relative salinity	Conductivity (millimhos/cm)	
					0.7 Factor	10000 Factor 0.984 factor
27	(composite)	800 66	865	214	low	0.305 0.428 0.334 ~ 0.5
27	"	1,000 66	1189	153	"	0.218 0.306 0.239 0.2 - 0.3
27	0-6 "	1,100 66	1189	153	"	0.216 0.306 0.239 0.2 - 0.3
28	0-6 "	1,100 66	1189	153	"	0.218 0.306 0.239 0.2 - 0.3
28	(composite)	1,100 66	1189	153	"	0.218 0.306 0.239 0.2 - 0.3
Site 27: Revag Garden (composite)		900 66	923	188	"	0.269 0.376 0.294 ~ 0.3
Horse Flat "		570 66	615	310	"	0.843 0.620 0.484 ~ 1.0
Horse Flat "		1,100 66	1189	153	"	0.218 0.306 0.239 0.2 - 0.3

Relative Salinity EC x 10³

Low Salinity 0-4
Slightly Saline 4-8
Moderately Saline 8-15
Strongly Saline >15

Fig. VIII-1.5. Salinity determinations (Feb. 5, 1975).

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Chapture V-2.1.

ANIMAL PATHOLOGY

A.O. Chapeau¹

INTRODUCTION

Condition of animals in the Kaiparowits Basin in the pre-operational phase of the power generating stations is of importance in evaluating potential changes in their health in the post-operational phase. Two animals were selected for study, viz. jackrabbits and mule deer.

Jackrabbits were examined because of their ubiquitous nature, their relatively large size, and the ease with which they could be obtained and autopsied. Further, jackrabbits can usually be obtained on a year round basis, and live mainly above ground; therefore the contribution of soil contaminants to their respiratory and circulatory systems would be minimal.

Deer were chosen because of their importance as big game species, for hunting is one of the most important outdoor activities in Utah and Arizona. This species was also chosen because of its interaction with livestock grazing on Four Mile Bench.

The vegetation of Four Mile Bench is basically woody and conspicuously lacking in herbaceous understory species. This is especially true under the pinyon-juniper communities. Because cattle, which graze on Four Mile Bench from 1 November - 1 April, are forced to use woody species even though by

¹Professor, Department of Zoology, Brigham Young University, Provo, Utah.

nature they are graziers not browsers, there is direct, often intense competition between cattle and deer for the same food resources. Heavy grazing has hedged all of the palatable browse species to the point that production of new twigs and branches is minimal.

Wherever herbaceous plants are present such as found on drill pads or edges of roads, half to two thirds of the current annual growth is consumed by rodents and lagomorphs. This further substantiates that there is keen competition among the herbivores for the food available.

The health of deer herds is tied to the nutritional quality of their forages (Dasmann and Taber, 1956; Plummer, Christensen, and Monson, ^{the Dept} Pederson, 1970). Herds which have low quality and/or quality food resources typically produce few recruits, are overaged, and are unhealthy. Often such herds are subject to parasites and other diseases. It was felt that the general pathology of the deer herd in the Kaiparowits Basin should be documented before the power generating stations become operational.

METHODS

Both deer and jackrabbits were taken with firearms, mostly while using spotlights at night. The Utah State Division of Wildlife Resources issued a collection permit for eight deer per year. Attempts were made to obtain deer near the two proposed plant construction sites, but on Nipple & Fourmile Benches success was limited. Therefore, some deer have been taken on Caanan Mountain during warm weather, when

they range at higher elevations, which is about 33 miles from Nipple Bench and 20 miles from Fourmile Bench. Deer census observations were made over selected routes at regular intervals and the numbers and sex were determined where possible.

Autopsies ~~have been~~ ^{were} performed as soon as convenient after jackrabbits were killed, but immediately after deer were slain. Best results were obtained with jackrabbits if they were autopsied within one hour after death. Thin slices of lung primary, bronchus and lung together, kidney, pancreas, spleen, adrenal, heart, aorta, skeletal muscle, and gonads, were taken routinely and fixed immediately in 10% formalin. From deer and from jackrabbits that were autopsied immediately after death, representative gut wall areas were also sampled and fixed immediately. Mucous membrane of the gut would be lost as a result of autolysis by digestive enzymes after about 15 minutes following death. Representative pieces of all of the tissues were prepared by the usual paraffin method, sectioned, and sections stained with Harris' hematoxylin and eosin and with Harris' hematoxylin and Gomori's Trichrome. All sections were examined with the microscope. Serial sections were also made through some of the livers that had nematode-induced pathology.

During 1974-75 three transects totaling nine miles were established. These were "cleaned" once a week by dragging a juniper tree behind a pickup truck. The transects were re-examined the following day approximately 24 hours later. The data were analyzed using the indices proposed by Tyson (1952, 1956):

$$\text{tracks per mile} = t = \frac{4N}{D}$$

deer per square mile = $Y = \frac{t}{D}$,
 where N = total deer ($4N$ = total tracks) and D = diameter of
 transect which is assumed to define the middle of
 a homogeneous deer habitat. (in miles)

RESULTS

Parasitic Liver Pathology

About 25 percent of the jackrabbits taken in 1972 and 36% ^{present} in 1973 were infested with a nematode affecting the liver (Fig. V-2.1). The population declined in numbers during 1972 and 1973. Based on numbers of jackrabbits encountered during those years, there were only about one-fourth as many of them in 1973 as during the preceeding year. Possibly this reduction was due to loss induced by pathological conditions, as there was severe focal pathology in and around large branches of the portal vein of the liver inside of which the nematode was located or inferred in all cases, and there was more widespread liver necrosis in five of the animals taken. The jackrabbit population increased in 1974 to about one-third of that present in 1972, and the incidence of nematode induced liver pathology decreased from 36 to 13 percent. This adds additional evidence to support the contention that disease is related to population fluctuations. (rough estimate of the 1974 population range from 0.60 to 1.20 rabbits per acre)

Monthly variations in the incidence of nematode infestation of the liver is also indicated in Fig. V-2.1. A peak is reached during the late summer of each year, and the

numbers are reduced thereafter though the autumn and winter seasons. Infestations of nematodes were found to be present during the second quarter in both 1973 and 1974, but were lacking in all six rabbits taken in June of 1972. It is not known if there is a seasonal delay in onset, or whether there is a geographical restriction in season and presence of the infestation. An insufficient number of animals was taken in the first quarter of each year to indicate the presence of nematodes during that portion of the year.

The areas from which jackrabbits were collected and the incidence of the nematode in liver is tabulated in Fig. V-1.2.

Histopathology of Liver

The photomicrographs illustrate the pathology produced by nematodes interacting with liver tissues. Formerly, it was assumed that the severe liver pathology was due to the parasitic tapeworm *Taenia pisiformis*, whose larvae (cysticerci) pass through the liver before becoming encysted in the cavities of the body (Chapman, 1974). This tapeworm was present in at least 16 percent of the jackrabbits.

Presence of the nematode parasite is demonstrated inside intense inflammatory granulomas of the liver in Figs. V-2.3, .4, .5, .8, and .9, and is shown to be enclosed by the remains of the wall of the portal vein branches in Figs. V-2.5, .8, and .9. Fig. V-2.3 shows one or two coiled nematodes, or three, lying parallel and cut crossways. Serial sections were cut for some distance through this block of tissue, with-

out revealing the total number of parasites. The nematodes are found in the midst of necrotic granuloma as illustrated best under high power (Fig. V-2.4 and .9). Sufficient numbers of animals were collected from Flattop Mountain and from the Paria Townsite in 1973 to indicate that the incidence of the parasitic liver pathology is of some significance by regions. The Glen Canyon City collection area is also near Flattop Mountain and both have grassland steppe vegetation. In 1972 and 1973, 41 percent of the animals collected from those two areas had the parasitic liver pathology, but none of the 10 taken in 1974 had the disease. Following 1972 Flattop Mountain also had the greatest decrease in jack-rabbit population of any of the areas. A very marked decline in population also occurred in the Paria Townsite region, which also has grassland steppe vegetation, and where 33 percent of the jackrabbits had parasitic liver pathology in 1972 and in 1973. As this area is some distance from proposed sites of the Kaiparowits generating station, no jackrabbits have been taken from there since 1973. The numbers of animals collected for the other areas in the region are not sufficient to indicate yearly incidence of the parasitic liver pathology, but some trends are noted. Liver pathology was not found at any time in jackrabbits from Butler Valley, or from Cedar Mountain and Four Mile areas in 1972 or 1973. Cedar Mountain and Four Mile Bench each yielded one jackrabbit with parasitic liver pathology of the four and five animals taken respectively from those areas in 1974.

Just inside the remains of the wall of the portal vein branch and surrounding the dead cells is seen a distinct layer of living lymphocytes, macrophages, a few heterophils (probably functional eosinophil leucocytes that look like neutrophil leucocytes, as both are called heterophils in some rodents and rabbits) and an occasional multinucleated giant cell. Outside the portal vein smooth muscle layer can usually be seen a granuloma layer of variable thickness composed mostly of heterophils, lymphocytes and macrophages, in descending order of prevalence, as shown in Figs. V-2.6, .9 and .10.

There are usually breaks in the wall of the portal vein branches through which the inflammatory cells extend farther into liver parenchyma outside the vein as demonstrated at the right of Fig. V-2.5, middle of Fig. V-2.6, right of Fig. V-2.8, and lower part of Fig. V-2.10. In fact, in more advanced pathological states of the liver, as seen in five of the jackrabbits, the wall of the branch of the portal vein becomes attenuated, fragmented, and sometimes destroyed as it enlarges greatly, probably due to internal pressure of a growing granuloma, as illustrated in Figs. V-2.5 and .6. Figs. V-2.8, right, and V-2.10 illustrate a break in the vein wall where the layer of chronic inflammatory cells, mostly lymphocytes, appear to be extended past the remains of fragmented smooth muscle. Fig. V-2.7 has no smooth muscle left as an example of complete destruction of the portal vein. That this smooth muscle of a portal vein, rather than a fibrous capsule surrounding the parasite and granuloma, has been confirmed

by Kent R. Van Kampen, Veterinary Pathologist, and by evidence gained from serial sections through several of the livers that have this parasite. Figs. V-2.11 and .12 illustrate how the inflammatory cells often extend out into smaller branches of the portal vein for some distance away from a parasite.

Tapeworm Larval Parasite

Taenia pisiformis was observed as cysticerci in body cavities, where they caused mild, chronic inflammation of the host cyst around the larval parasite and of the organ, peritoneum of pleura, to which they were attached. They were observed in 11 of the 70 jackrabbits, which is 16%, and only one of them also had the nematode. No specific liver pathology could be attributed to these parasites in the specimens examined in this study. Some of the dead parasites in portal vein branches in the liver could not be specifically recognized as nematodes, but we assume that these are not tapeworm larvae because they are said to burrow through the liver rather than remain in the veins. If that is the case, it appears that they would not cause death of the jackrabbit. However, large numbers of this parasite may slow its ability to escape from predators and thus allow the tapeworm to complete its life cycle in the main definitive host. Tapeworm cysts probably of Multiceps serialis also occur in some of the jackrabbits, some cysts are very large and these can also lead to early mortality.

Other Pathology

In addition to the pathology associated with the nematode in the liver, other diseases of the jackrabbits are summarized in Fig. V-2.13. They usually consist of mild, chronic inflammation or degeneration, which probably do not endanger the life of the animals. However, since bronchitis or emphysema are the most common lung diseases, they may slow down the animal when it is pursued by a predator and thus contribute to reduced population. The high incidence of 34 percent of these other diseases for the three years, also seems to be of value as part of this study.

The deer taken from the area had 59 percent with mild to moderate pathology, as tabulated for each year in Fig. V-2.14. The severe degeneration of the spleen in one taken in 1974 might have endangered this animal, but the other diseases would probably not do so. In both jackrabbits and deer the main diseases of the lung are bronchitis and emphysema, which are often associated with industrial air pollution, have special significance here.

DISCUSSION

Only recently have we been able to recognize that the parasite of the portal veins in the liver are nematodes, not Taenia pisiformis. Evidence to support this was obtained by examination of serial sections of some livers. Hypodermal chords can be clearly seen in three of the parasites isolated in the serial sections. Such chords are characteristic of nematodes and are not found in cestodes, to which tapeworms

belong. Even though it is not certain because of the lack of positive structural identification of some parasites in the liver the associated pathology is suspected to be produced by nematodes. This parasite is consistently in portal vein branches of the liver and is always surrounded by a characteristic layered granuloma, which strongly suggests that all of them are nematodes rather than a tapeworm. The larvae of Taenia pisiformis usually burrow through the liver; however if such larvae die, they can cause inflammatory responses similar to that of the nematode (Cohrs, 1967, and Silverman and Hull, 1961); later the tapeworms appear as characteristic cysticerci in body cavities (Health, 1973a and 1973b; Morgan and Waller, 1940; and Platt and Campbell, 1974). No report has been seen of the tapeworm larvae remaining in portal vein tributaries in the liver, so it seems likely that the severe pathology in livers we have found is entirely due to the nematode. Only one jackrabbit was found to contain both tapeworm and nematode.

By making a careful study of the structures of the nematode, especially with serial sections, Dr. James Palmieri² keyed them to the Superfamily Heterocheilidae. Cheng (1973) lists a few genera of this group to be found in mammals. Some of the mammalian hosts obtain parasites of this superfamily by eating fish, but others that act as hosts of the genus Contracaecum might have a different diet. We are now looking for jackrabbits with the typical liver spots from which a whole parasite may be extracted for more specific identification.

~~Research Associate, Department of Zoology, Brigham Young University, Provo, Utah 84602.~~

²Research Associate, Department of Zoology, Brigham Young

cation. The incidence of such spots in the liver seems to be reduced in the jackrabbits collected during 1975.

Sometimes red blood cells are seen among the inflammatory cells of the granuloma in the portal veins in the liver, as if blood is able to pass through in limited quantities, but this is not the case where the parasite is situated. Thus, these vessels are completely blocked and sometimes completely destroyed, progress to more extensive degeneration of liver parenchyma as found in five jackrabbits. Jubb and Kennedy (1963) describe a self-perpetuating process of liver necrosis and death, presumably due to fibrotic pathological changes obstructing portal tributaries. The parasitic granulomas are usually present in fairly large portal veins, and even though hepatic arteries supply the areas with oxygenated blood and prevent infarction, progressive degeneration would be expected from blocking such portal veins. That same pathology text (loc cit) also cites estimates that two-thirds of the blood circulated in the liver is carried through portal vein tributaries. Thus, it seems likely that the massive lobular necrosis seen in five of the jackrabbits could progress and cause death.

There are varied opinions among parasitologists whether T. pisiformis causes mortality in jackrabbits. Our observations indicate that no specific pathology can be attributed to them, except mild to moderate infiltration of lymphocytes and heterophil leucocytes in the host capsule that usually surround the cysticercus when it is attached to the serosa of the body cavities.

On the other hand, this cestode and the nematode might be factors in the population changes we noted between 1972 and 1973. Wagner (1972) and Wagner and Stoddart (1972) review the relationship of coyote and jackrabbit population in Utah. They attribute jackrabbit population variations as perhaps due to coyote predation, disease, changes in food supply, changes in reproductive rate during high density, social unrest, or some combination of these factors. They conclude that the coyote appears primarily to hasten and deepen the decline phase of the jackrabbit population cycle and that coyote predation alone does not determine the density of small mammal populations. The jackrabbit is evidently the main food of the coyote, according to their results. As stated above, it is likely that these two parasites could slow down the jackrabbit and make it an easier prey for the coyote. The increased incidence of the nematode parasite in the liver from 25% ^{in 1972} in 1972 to 36% ^{in 1973} in 1973 appears to be strong circumstantial evidence that it is a factor in the population decrease.

Deer Pathology

Data taken from track counts Fig. V-2.15 demonstrate that the deer population on Four Mile Bench, in the four townships which cover most of the area, averages less than 0.1 animal per square mile. Numbers change with the season, however, and this indication of population is a general one. Certainly, no large population is present.

About 52% ^{of all deer taken} of all deer taken (10 of 17) in the period

1972-1974 demonstrated pathology in one or more organs.

Pathology was not severe in most of these animals. Only the one taken in 1974 which had severe degeneration of the spleen might have died from its pathological condition. However, almost one-fourth (4 of 17) of the animals showed evidence of lung pathology. While not serious, this evidence supports the idea that any severe changes in atmospheric pollutants might result in more serious lung conditions.

It is suspected that the mild, chronic lung conditions and the lack of food are interacting factors causing the herd to be small. Field observations indicate that most of the females are barren. This usually indicates that a herd is over-aged, and stagnant or declining. It ~~is~~ ^{has} declining ^{ed} on Four Mile Bench.

Conclusions

Animal pathology, as indicated in jackrabbit and deer populations, is a factor in the Kaiparowits Basin. Major pathological conditions noted in jackrabbits involve those dealing with nematode infestations, especially destructive of the portal vein and adjacent parenchyma in the liver. Deer pathology is more general and concerns many body organs, but with one exception the pathology is usually mild. This condition may be compounded by the lack of food to cause a declining deer herd on Four Mile Bench.

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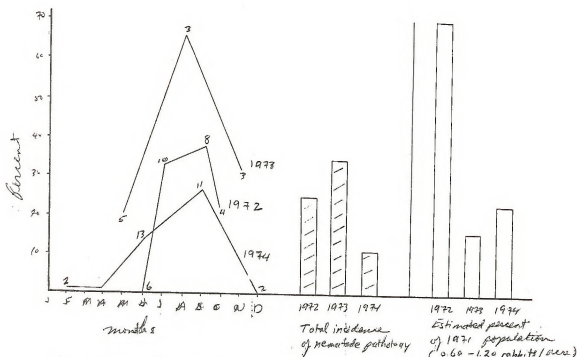


Fig. V-2.1. Incidence of nematode caused liver pathology each month and each year (numbers on graph are numbers of jackrabbits sampled).

Areas Where Jackrabbits Were Collected	1973			1974		
	No. of Animals	No. With Pathology	% With Pathology	No. of Animals Taken	No. of Animals With Pathology	% With Pathology
Flatop Mountain	15	6	40	10	0	0
Paria, near old townsite	10	3	33	0		
East Clark Bench (Near Glen Canyon City)	2	1	50	0		
Smoky Mountain and Nipple Bench	3	1	33	7	2	29
Cedar Mountain	3	0	0	5	1	20
Four Mile Bench and Cow camp	3	0	0	4	1	25
Butler Valley (mostly reseeded area)	3	0	0	5	0	0

Fig. V-2.2. Incidence of nematode-caused liver pathology in jackrabbits from various areas.

Fig. V-2.3. Severely necrotic area in the liver of jackrabbits #36 showing three cross sections through nematode parasites (p) or one that is coiled.

Fig. V-2.4. Higher power of the bottom part of Fig. V-2.3, showing a parasite (p) surrounded by necrotic inflammatory cells.

Fig. V-2.5. An area of the same section as on the lower right side of Fig. V-2.3, representing approximately the radius of the portal vein (s) that contains the parasites (p) and associated granuloma.

Fig. V-2.6. Higher power of the upper right part of Fig. V-2.5 and adjacent area. Inflammatory cells are seen on both sides of vertical strands of smooth muscle (s) of the portal vein wall.

Fig. V-2.7. Severe inflammation in jackrabbit #36 liver some distance from a parasite. Lobular parenchyma has been replaced by granuloma, except for hepatic arteries (h) and metaplastic bile ducts (b). No remains of portal vein can be seen.

(The line on Fig. V-2.3 represents 15 microns on Figs. V-2.3, .5, .7, .8, and .11 and represents 40 microns on Figs. V-1.4, .6, .9, .10, and .12.)

Fig. V-2.8. A nematode parasite (p) and granuloma inside the remains of the wall of a portal vein (s) in the liver of jackrabbit #37.

Fig. V-2.9. Higher power of the upper part of Fig. V-2.8. The inflammatory cells are less necrotic on each side of the smooth muscle (s) of the portal vein than it is immediately around the parasite.

Fig. V-2.10. Higher power of the upper right part of Fig. V-2.8. The smooth muscle wall (s) of the portal vein branch is fragmented. Note the bile duct (b) and hepatic artery (b) branches and more normal liver tissue, upper right.

Fig. V-2.11. Two smaller branches of the portal vein (s) in the liver of jackrabbit #36, which contains inflammatory cells that have evidently spread out for a few mm from the larger branch of the vein that contains a parasite.

Fig. V-2.12. Higher power of an area at the left of Fig. V-2.11. A portal triad is seen, with inflammatory cells in the portal vein (s).

(The line on Fig. V-2.3 represents 15 microns on Figs. V-2.3, .5, .7, .8, and .11 represents 40 microns on Figs. V-2.4, .6, .9, .10, and .12.)

Number of Jackrabbits Taken ¹	1972	1973	1974
	23	11	31
Organ	Number of Organs with Pathology Each Year		
Lung	7	2	8
Kidney	2	0	3
Liver	1	1	5
Small Intestine	0	1	5
Heart	1	0	0
Pancreas	1	0	0
	11 39%	3 27%	13 42%

¹ Pathology was present in two organs of one jackrabbit in 1972, one in 1973 and in 1974; therefore, total pathology is greater than total number collected.

Fig. V-2.13. Summary of ¹⁷ other pathology found in ¹⁷ jackrabbits.

	Butler Valley 2 miles	Tommy Smith Creek to Four Mile Wash 3 miles	Four Mile Plant Site 4 miles	Totals
Sept. 1974	0	0	0	0
Oct.	2	1	8	11
Nov.	0	1	10	11
Dec.	0	0	0	0
Jan. 1975	0	0	0	0
Feb.	0	0	0	0
March	0	0	3	3
April	0	0	0	0
May	0	0	0	0
June	0	0	0	0
July	0	0	0	0
Aug.	0	0	0	0
	2	2	18	22
Ave.	0.17	0.17	1.50	1.83
Tracks mile (t)	0.11	0.11	0.48	0.26
Deer/square mile (y)	0.05	0.05	0.12	0.07
1972 Data:				
t				4.46
y				0.45
Y 1974-75				
Y 1972 (May-Dec.)				16%

Fig. V.2.15. Track count data from Four Mile Bench

Number of deer taken	1972	1973 ¹	1974
	3	7	7
Organ	Number of Organs with Pathology Each Year		
Lung	1	2	1
Kidney	0	1	1
Liver	1	0	1
Spleen	0	0	1
Skin	0	1	0
Heart	0	1	0
Total Animals	2 66%	4 57%	4 57%

¹ One of the deer had pathology in two organs.

Fig. V-2.14. Summary of pathology found deer.

		Grasses	Forbs	Total
Grassland	Site 3	369	767	1156
	Site 30			
Dunes	Site 10	185	235	420
Blackbrush - Spiny Hopsage Habitat-type				
	Site 8	208	244	452
	Site 14	140	222	370
Sagebrush	Site 26	260	425	685
Woodland	Site 2	176	224	400
	Site 27	T	50	50

Fig. 1-4.29. Production of understory herbaceous species: 1973.

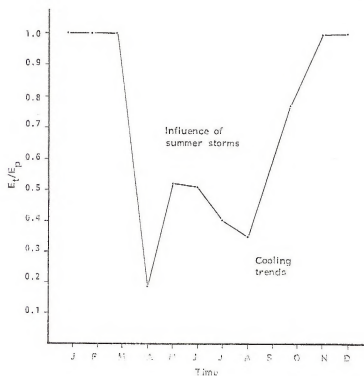


Fig. 1-4.29. Production of understory herbaceous species: 1973.

CHAPTER 1-4

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Vegetation of the Kaiparowits Basin:
An Overview

B. W. Wood, S. L. Welsh, and J. R. Murdock

INTRODUCTION

Because of the diversity of habitat-types (Daubenmire, 1968) within the Kaiparowits Basin, a large number of study sites was selected for the environmental baseline studies (Fig. 1-4.1). The sites were chosen according to direction, distance, and accessibility from the Navajo Generating Station and the proposed Kaiparowits Generating Station, and according to vegetative differences. Some 30 sites were selected during the summer of 1971. As time and monetary resources became limiting the number of principal sites was pared to 12 of which Sites 3 (Cedar Mountain), 10 (Ahlistrom Point Road), 14 (Nipple Bench), 23 (Cathy Flat north of Nipple Bench), 27 (Four Mile Bench), and 34 (confluence of Tibbet and Warm Creek canyons) were the most intensively studied.

The principal objectives of the vegetation studies were to determine the effects of climate on vegetation and to determine which species could be used to monitor seasonal as well as yearly changes in climate. Such species then could be used to test the basic hypothesis of these environmental studies, i.e. that the generating stations will not have a significant impact upon the desert ecosystems of the Kaiparowits Basin. In other words, species would be identified which could be used to monitor environmental quality.

METHODS

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Vegetation Map

At each of the selected study sites, a comprehensive inventory was carried out to determine relative importance of the species present and to evaluate where the ecotones between vegetation types were located. This information was used as guidelines for mapping the vegetation within the Kaiparowits Basin. The vegetation map was prepared using ERTS photographs and remote sensing techniques described by Poulton, Faulkner, and Martin (1971). After the basic units were delineated on the photos, ten percent of the area was randomly selected to verify the photo interpretations.

Most of the mapping units are designated by the dominant species. However the blackbrush (Coleogyne ramosissima) and the shadscale (Atriplex confertifolia) types were designated primarily by the presence of these species. In the case of the blackbrush communities this was done because blackbrush is not representative of any adjacent physiographic regions. And in the case of the shadscale communities sufficient information is not available to differentiate the different habitat-types or the successional status of any of the stands selected for this study.

Soils

Two soil pits were dug at each study site. These were the basis for classifying the soils according to the comprehensive system used by the United States Department of Agriculture (1970) and Buol, Hole, and McCracken (1973). Soil samples were obtained from these pits to determine texture (Bouyoucos, 1927), salinity with the Wheatstone Bridge (Davis and Bryan, 1910), the moisture indexes of 1/3 atmosphere and 15 atmospheres

using the pressure membrane apparatus (Richards and Weaver, 1944; and Richards, 1949). Bulk density was estimated using the bulk density sampler manufactured by Soil Test, Inc. The data are calculated from volume, texture, weight and moisture content. Infiltration rates were measured using Salverson tubes by recording the time required for replicate 25 ml aliquots of water to enter the soil.

Vegetation and Precipitation

Two permanent, 100 meter transects were established at each site from which the line-intercept (Canfield, 1941) and canopy-coverage (Daubenmire, 1959) methods were used to determine cover of the woody and herbaceous species, respectively. Composition of the shrubs, non-woody perennials, and annuals were determined from these cover data. The precipitation was measured monthly using standard weather bureau gauges or No. 10 cans which were calibrated against the standard gauges. Regression analyses were used to determine the relationships between precipitation and the vegetational parameters.

Productivity

Productivity of selected herbaceous species and Mormon tea (Ephedra viridis) was determined by clipping the current annual growth. Ten to 15, 9.6 sq. ft. circular plots were placed in a grid system within uniform stands to obtain these data.

Because it is tedious and requires a great deal of man power to determine productivity of trees and shrubs, the length of the current annual growth was measured rather than clipped. The length of growth to unit amounts of precipitation would allow the two life forms to be sampled in the

same manner, thereby making the data comparable.

RESULTS

The Kaiparowits region is part of a transection zone between the Sonoran and the Cold Desert Shrub regions. The vegetation generally consists of widely spaced plants representative of the three adjacent physiographic regions, i.e., Great Basin, Colorado Plateau, and Sonoran Desert. The principal shrub and grass species such as spiny hopsage (Grayia spinosa), Mormon tea, galleta grass (Hilaria jamesii), Indian ricegrass (Oryzopsis hymenoides), blue grama (Bouteloua gracilis), and Utah Juniper (Juniperus osteosperma) link the Kaiparowits Basin to these surrounding regions. Blackbrush is unique to this transition zone.

Despite the barren appearance of the lands within the basin, the flora is rich (Chapter I-2). The soils as they relate to specific geologic formations, and the distinctive patterns of precipitation create a large number of microenvironments, thus making the area unique floristically as well as ecologically.

The region is dominated by benchlands and plateaus set on different geologic formations (Fig. I-4.2). The benchlands of each elevation receive seasonal rainfall peculiar to that level and to the topographic control of adjacent features. Precipitation data for the month of June 1973 and 1975 are presented in Fig. I-4.3 to illustrate the variability that can occur (see also Chapter VII-1).

Vegetation Map

The strongest relationships between the vegetation and geologic

formations are mat atriplex (Atriplex corrugata), shadscale (A. confertifolia) and pinyon (Pinus edulis)-juniper communities which are common to the Tropic Shale, Straight Cliffs, and Kaiparowits Formations, respectively. These three communities represent about 69 percent of the vegetation in the Kaiparowits Basin, whereas the blackbrush communities represent less than 3 percent. Approximately 40 percent of the basin is dominated by communities which contain at least one salt tolerant species.

The map does not include the wash vegetation because it is only developed in local areas; hence, it is hard to map at the scale used. Even though this type is not extensive, it probably undergoes more changes because it is subject to the vagaries of the thunderstorms which frequently occur. Information concerning this type will be presented in a separate paper (Murdock, Wood, and Welsh, unpublished manuscript).

The soils on any benchland vary from wind blown sand to sedimentary clays, giving a variety of edaphic situations on each bench. The slopes drop from the plateaus to the benchlands below, producing exposures in all directions.

The diversity of habitat-types and the location of the Kaiparowits Basin in a region where floras mix account in large part for the richness of the flora. Woodbury (1947) considered the Kaiparowits Basin as part of a regional ecotone between the surrounding physiographic regions. Even though it is an ecotone it has its own endemic communities of which the blackbrush community is one of the most unique. Other endemic communities, which are often ephemeral, are found on the clay formations. From the vegetation map (Fig. 1-4.4) it can be seen that the Great Basin has had the

greatest influence on the vegetation.

Soils

For the most part, the soils are Entisols (soils without pedogenic horizons) with Typic Torripsamments (hot, dry sands), and Lithic (rocky) and Typic Torriorthents (hot, dry common soils) being the most common families represented.

Grassland Communities

Grass-Mormon tea-Yucca-Vanclevea Habitat-type. Soils of this vegetation unit have been derived from weathered sandstone blown into dunes or gently rolling mounds of deep sand up to several feet in depth. No concretions or restrictive layers are present and the soils have a rooting depth at least three feet (one m) deep. Although there is evidence of zones of illuviation and eluviation of dissolved minerals such as calcium and organic matter textural size redistribution in the profile are almost non-existent. Even though these soils have low moisture holding capacities, they are productive because of their depth.

Mixed Grasses Habitat-type. The soils are both Lithic and Typic Torriorthents which have developed from the Cretaceous Straight Cliffs Formation. Commonly the profiles are shallow, having an A horizon of only about 4 inches (1 dm) in depth. Non-saline, sandy loams and loamy sands are the prominent soil textures and vary from rocky, calareous to non-rocky, loose non-calareous soils.

Blackbrush Communities

Soils are Lithic Torriorthents derived from the Carmel, Dakota, or Straight Cliffs Formations. They are shallow with a calcium hardpan or

the C horizon within 16 inches (4 dm) of the surface. Usually rocky and highly calcareous, they have an effective rooting depth of only 10 inches (2.5 dm). Either sands or loamy sands are the most common textures encountered throughout the profile. The soils are non saline. Initial infiltration rates are high (e.g. 1.05 cm of water per minute) which allows these soils to be recharged with moisture both rapidly and throughout the entire profile.

Saltbush Communities

The mat-atrilex habitat-type is typically found on soils derived from Tropic Shale, whereas the shadscale types are found on outwash pediment of the Straight Cliffs Formation.

Mat atrilex habitat-type. The Tropic Shale is not well weathered because precipitation usually seals the soil surface causing runoff conditions. There is a paucity of species and plant cover due, most likely, to high percentages of clay and high salt content. Surface layers contain as much as 23,000 ppm of total dissolved salts. Because of the high clay and salt content and because infiltration is very low, these soils are arid. Often not enough moisture is added even during the winter period to exceed the wilting percent.

Shadscale Habitat-types. The soils of the shadscale habitat-types are Typic Torrifluvents. These soils are extremely rocky or have a limiting hardpan of calcium six to ten inches (15 cm to 25 cm) below the soil surface. Consequently a great deal of the soil moisture is evaporated directly from the soil when it warms up. Frequently there is not sufficient soil moisture to support new growth; the plants merely produce small leaves and little, if any, current annual growth. Also, the sites are often devoid of forbs,

especially annual species, because of the prevailing droughty conditions. Sagebrush Community

The sagebrush habitat-type is found interspersed in the pinyon-juniper areas. The sites represent areas of accumulation and usually are surrounded by knolls. The soils are non-saline, silty sands which usually are void of rocks. The A horizon which represents the rooting depth is at least 32 inches (81 cm). The soils are derived from the Kaiparowits Formation. Badlands and Slickrock

These areas have one characteristic in common; that is, they have excessive runoff because the surface layers become sealed when wetted or because the surface is rock. Only the microhabitats may contain sufficient quality or quantity of soil to support plants.

Pinyon-Juniper Communities

Soils of these communities are sandy or sandy loam Typic Torripsamments or Lithic and non-Lithic Torriorthents. They occur on Navajo Sandstone, Straight Cliffs, and Kaiparowits Formation and are shallow, only four-eight inches (1-2 dm) deep, often with the parent material just below the A horizon. The parent material which is fractured is usually restrictive to the growth of herbaceous understory species. However the trees and shrubs are able to penetrate the fractures which act as micro-watersheds allowing sufficient moisture to infiltrate to support woody plant communities.

Plant Communities

Even though the general aspect of the vegetation seems to be dominated by only a few shrubby or grass species, there are approximately

40 species that are important in the various plant communities, i.e. they typically have a cover composition greater than one percent. Fig. 1-4.5 is the list of the species that have characterized the study sites each growing season since the baseline studies were begun in 1971.

There are at least 800 more species, many of which are endemic, that have been collected but were not sampled. These latter species may be rare to locally abundant depending upon soil moisture and/or kind of soil, or soil chemistry.

Even though there are similarities between the communities represented by the study sites, the dissimilarity is stronger because each site was chosen to represent the variability with the Kaiparowits Basin.

Grassland Communities

Grass-Mormon tea-Yucca-Vancevea Habitat-type. This type is characterized by woody species which stabilize small sand dunes with herbaceous species dominating the interspaces between them. The spring flora consists of annual species such as Lupinus pusillus and Cryptantha spp. Perennial grasses such as Indian ricegrass and Bouteloua spp., yucca (Yucca baliayii), and Mormon tea are the conspicuous species in late spring and summer. Vancevea stylosa and other composite shrubs bloom in late summer into fall.

This type is found on Cedar Mountain which usually receives more moisture during the winter period than similar areas dominated by this kind of vegetation. The result is that the Cedar Mountain site has about three times the species as found on the Ahlstrom Road site.

Mixed Grasses Habitat-type. Because these grasslands are principally

composed of galleta grass, blue grama, Indian ricegrass, and sand dropseeds (Sporobolus spp.), needle and thread grass (Stipa comata), and three-awn grass (Aristida spp.), the aspect dominance changes frequently throughout the growing season. Galleta grass, an opportunistic species, responds to every major storm and may appear to be dominant in spring, summer, or fall. The other species for the most part are either warm or cool season species. These grasslands may even appear to be shrublands because Mormon tea is found throughout all the stands. The presence of this species is especially noticeable during drought years or dry summers when flower culms are not produced by the grasses.

Blackbrush Communities

Blackbrush Habitat-type. The stands of blackbrush are widely scattered within the Kaiparowits region. These stands seem to be quite stable in that there are not marked changes in species composition from year to year. The stands even appear decadent because even in the healthiest stands the average vigor was measured at 2.5 based on a scale of five vigor classes; this means that most of the plants are in a half dead condition.

Blackbrush-Spiny Hopsage Habitat-type. Wherever intergrading conditions of soil depth and texture occur blackbrush may become co- or sub-dominant to spiny hopsage. Also, other species such as galleta grass and blue grama become more important. The vegetation map contains two map units of this type and sufficient data are not yet available to determine the successional dynamics of this type.

Saltbush Communities

Mat atriplex Habitat-type. The Tropic Shales typically have the fewest

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species per unit area of any site studied within the Kaiparowits Basin.

Often less than six species of vascular plants will be present. In some years the area will be completely devoid of plants, and in others, e.g. 1973, Oenothera and Placelia spp. may form a dense carpet. Because these dark colored soils are among the first to warm up in spring, the plants often reach maximum growth by mid March, and finish by mid April. Plants of the surrounding areas continue to grow at least into May. Because of the restrictive conditions for plant growth, some species are specifically adapted to shale soils. Some of the areas of Tropic Shale are periodically dominated by the endemic composite Viguiera soliceps. Clemmella palmerana is also a rare species found on Tropic Shales of this region.

Shadscale Habitat-types. There are perhaps four distinct habitat-types which contain shadscale as a dominant species. However more data are needed to differentiate the basic differences and dynamics of these types.

The shadscale types are found on the benchlands adjacent to the Colorado River system and the benchlands just below those dominated by the pygmy forest. In addition to shadscale, budsage (Artemisia spinescens), winterfat (Eurotia lanata), and broom snakeweed (Gutierrezia sarothrae) may be abundant enough to have frequency values equal to or greater than 30 percent. In dry years herbaceous species are usually absent. When sufficient moisture is received species such as sego lily (Calochortus spp.), funnel lily (Androstaphyllum breviflorum), and Eastwood's evening primrose (Oenothera eastwoodiae) are the most prominent herbaceous species. When present these species are usually widely distributed within the stands, e.g. frequencies equal to or greater than 80 percent. The following data are typical

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for dry years:

BYU Site 9	Cover Percent	Percent Frequency	Ave. Height	Ave. Vigor ¹
<u>Atriplex confertifolia</u>	3.2	55	2.6	2.0
<u>Artemisia spinescens</u>	2.2	35	2.2	3.1
<u>Lycium andersonii</u>	0.6	10	4.0	2.0
<u>Eurotia lanata</u>	0.8	30	2.0	3.4
<u>Opuntia polyacantha</u>	0.2	5	3.0	1.0

Sagebrush Habitat-type. The sagebrush communities are most commonly found in openings in the pinyon-juniper woodland. Also, a few stands are found just below this woodland, perhaps as an ecotone between the woodland and the spiny hopsage and blackbrush communities. These two conditions are found on Four Mile Bench and Smoky Mountain, respectively. These communities are distinct from those typical of the Great Basin in that the grass species in the understory are usually galleta grass and blue grama instead of wheat- or bluegrasses. And the forbs are most often annual species except for globemallow (Sphaeralcea parvifolia) whereas those of the Great Basin are often perennial species with some annuals present.

Pinyon-Juniper Habitat-types

Scattered Juniper Habitat-type. There are scattered pygmy forests dominated by juniper on Smoky and Cedar Mountains. This type is quite variable in terms of the understory species. This type may in fact be an ecotone, which may be quite broad, between pinyon-juniper communities and those typical of lower elevation.

¹Based on 5 point scale with 5 being the most vigorous.

Rimrock-Pinyon Juniper Habitat-type. The rimrock type is characterized by extremely rocky soils at the edges of plateaus. This type is floristically rich due to the microenvironments created by variable depths and quality of soil, and moisture availability for plant growth. The rocky nature of the surface simulates a mosaic of microwatersheds, thereby often increasing the amount of moisture available for plant growth, especially for the shrubs and herbaceous species.

Pinyon-Juniper Habitat-type. The structure of the overstory canopy of the pinyon-juniper type is illustrated in Fig. 1-4.6. The lack of juniper seedlings is because grazing by both deer and cattle is rather intense. All the understory species, except perhaps cactus (Opuntia polyacantha), are extremely hedged. The largest size class of juniper probably should be divided into two classes, but the oldest trees are usually a cluster of one to several stems which break away and fall to the ground (See Fig. 1-4.7). In terms of the overstory stratum the forest is virgin where trees and dead wood are little disturbed by man or fire.

Hanging Garden Habitat-type. (See Chapter IV-1)

Effect of Precipitation

By iteration it was discovered that precipitation received from July through June of the following year is best correlated (90% significance) with vegetational parameters. The patterns of precipitation for the study sites are illustrated in Figs. 1-4.8 through 4.19.

Fig. 1-4.20 presents the relationships between number of species, total cover, composition, and the moisture year. These equations do not deviate

more than five percent from the actual data. Since these correlations were obtained from data representing relatively undisturbed vegetation, there are baselines from which these equations hold true. It appears that between 3 to 5 inches of precipitation must be received to maintain the minimum amount of plant cover and the minimum number of perennial species characteristic to each habitat-type. More data are needed to establish this threshold. The maximum response of the vegetation was probably observed in 1973; these data are reported in Fig. 1-4.21.

In desert and semi-arid desert environments it has often been found that it is not the prominent, persistent species that characterize the differences that occur within a community from year to year, or the differences between similar communities, but it is the ephemeral species that do so. Although the dominant species are sensitive to changes in the environment, they tend to persist over a wider range of variation than the annual species. The major changes in number of species, plant cover, and percent composition of each life form of plants are basically the changes in the annual species in response to precipitation.

In general it is the steppeland vegetation that is most responsive to increased precipitation, whereas the pinyon-juniper types on Four Mile Bench are the least responsive. Field observations indicate the possibilities of revegetation are good for the sagebrush sites on Four Mile Bench. However more information and experience are required to make judgments concerning the probable success of rehabilitation on the lower elevation steppelands.

The equations in Fig. 1-4.20 are based upon four years of data and certainly need to be refined over time. The relationships between the vegetational parameters and precipitation were surprisingly linear, thus

giving significant correlations. This may be due to the small sample size.

Nevertheless these data are the best estimates to date and seem to be reasonable.

Productivity

Because of the variability from sample plot to sample plot within a site, relatively large sample sizes are required in order to obtain data which have a realistic confidence level. For example, a sample size of 35 plots was required for most productivity data to obtain a standard error of the mean within ten percent of the mean. However, because of manpower restraints the sample sizes were one-third to one-half the desired level. Therefore the locations sampled were selected on the basis of uniformity with the samples placed in a grid pattern so that a high degree of consistency would be obtained in the data even though a smaller sample was obtained.

Evergreen Species

Mormon tea is one of the most wide spread woody species within the Kaiparowits Basin. This species produced vegetative growth each growing season from 1971 through 1974. However, only in 1973 was it possible to obtain precise data on the amount of current annual growth produced. This ubiquitous species lost joints of the stems whenever droughty conditions prevailed. It is essentially a deciduous species. During 1974, Mormon tea lost all of the current annual growth before maximum growth occurred; then it abscised most of the older growth so that only one to three joints remained on any stem.

The production data of Mormon tea for the 1973 growing season are given in Fig. 1-4.22. These data are from sites where this species is most

important in terms of species composition.

The data reported in Fig. 1-4.23 are estimates of the relationship between precipitation and the amount of current annual growth. The 1972 and 1973 data are what would be expected in relation to increased precipitation from 1972 (Ave. 5.99 inches) to 1973 (Ave. 13.96 inches). However, that received in 1974 (Ave. 4.44) is not consistent with the growth of previous years. One possible explanation is that during 1974 there was no competition from herbaceous species and Mormon tea has as many or more roots in the surface layers of soil as it does deep in the soil. And without such competition, this species had enough moisture to put on a large amount of stem growth.

This species is a relatively long lived species; therefore the frequency and cover percentages and size of plants remain essentially constant from year to year. It is so sensitive to climatic changes that precise data in relation to these changes are difficult to obtain. Hence, it cannot be effectively used to monitor environmental quality or plant growth related to climatic factors.

In most years the amount of current annual growth produced by evergreen trees (See Fig. 1-4.24) appears to be more than that produced by the shrubs. This may be because these trees can grow any time conditions are favorable.

The total amount of current annual growth of tree species may not be as critical to the well being of the plants as the length and number of leaves. For example, these parameters of pinyon pine are not constant from year to year. And the data indicate the length of the leaves is less sensitive to changes (Fig. 1-4.25) than the number of leaves (See Fig. 1-4.26) produced

each year. Future studies will investigate the correlations among precipitation, soil moisture and air temperature on the number of leaves produced and the number retained on the plants. It appears these parameters could be used as indexes of environmental quality as well as climatic changes.

Deciduous Shrub Species

The data in Fig. 1-4, 27 indicate that the total amount of precipitation is not the best way to evaluate changes in productivity. The season in which precipitation is received appears to be the strong factor influencing the amount of growth. An analysis of the difference between the means of the seasonal precipitation recorded from July 1971 through June 1974 is as follows:

	July - September	October - March (inches)	April - June
\bar{x}	1.61	5.07	1.45
S_R	0.1442	0.7157	0.1844

July - Sept. vs April - June
 July - Sept. vs October - March
 October - March vs April - June

$t = 0.663$
 $t = 4.733^{**}$
 $t = 4.899^{**}$

Almost without exception, the differences in production of the shrub species between similar habitat-types are related to the amount of precipitation received in October through March. Also, edaphic factors such as soil depth and texture interact to influence the amount of water available for plant growth. The relationship of these factors to available water in the soil are given in Fig. 1-4, 28. (Percent available moisture on oven dry weight basis \times bulk density \times depth of soil in inches equals inches of available moisture.) The specific contribution of soil texture, depth, and infiltration and their interactions in relation to plant growth will be investigated in future studies.

Herbaceous Species

Precise data on total production are as difficult to obtain for herbaceous species as for Mormon tea. In semi-arid regions which typically have spring moisture, most of the plants mature at nearly the same time. In such environments total production is correlated with precipitation (Hutchings and Stewart, 1953). However, in the drier environments of the Kaiparowits Basin the cool and warm season species mature at different times. When soil moisture is limiting the herbaceous plants, especially the warm season grasses, may produce only limited vegetative growth and no flowers.

Because the maturation of species is not synchronous, production data often must be obtained on a species by species basis; this requires several sampling periods which decreases the likelihood of obtaining precise data. Nevertheless, the precipitation of 1972-73 and the temperatures of the growing season were such that the differences between cool and warm seasons were essentially removed. When the data were obtained (See Fig. 1-4, 29) the cool season species were in late fruit development and those typical of the warm season were in early fruit. It was assumed this period was an adequate compromise to obtain maximum production before the weathering processes destroyed the current annual growth. The only species not sampled were the late winter species such as the annual lupine and the late summer flowering composites.

Sufficient data have not been obtained to determine the correlations between production and precipitation. Eight years of data were used in western Utah to define this relationship (Hutchings and Stewart, (1953). Because the variation in production is large, and because large sample sizes

are required to obtain such data, it is unlikely that total production will be sensitive to environmental quality except when large amounts of toxic substances or elements are put into the ecosystems. Individual species such as pinyon, blackbrush, and spiny hodge are probably more reliable indicators of environmental change.

Consumptive Use of Water

Sufficient data have not yet been obtained to adequately quantify the consumptive use of water for each vegetation type or for any one species. The consumptive use is defined as the ratio of soil moisture removed by evapotranspiration (E_t) processes to that removed by evaporation (E_p). Examination of the soil and air temperature data indicates that it is reasonable to assume that during November through March the soil supplies moisture fast enough so that $E_t \approx E_p$. Assume that the soil depth is 5 dm (19.7 in) and that the bulk density of the soil is 1.40 gm/cc. This would be typical of some blackbrush communities. The water use trends for this vegetation type has been theorized from the Blaney-Criddle equation (Blaney and Criddle, 1966) and are presented in Fig. 1-4.30. The weakest portion of the graph is the values for August and September. The ratio of E_t : E_p can be quite variable because of the cooling trends associated with summer thunderstorms.

The water use in October and April may also be variable. Even though E_t is typically lower than E_p during these months, field observations indicate that temperatures may be favorable for the growth of annuals. If this occurs in October, basal rosettes may be produced by several annual species which become hardened to winter temperatures and persist "dormant" until favorable temperatures occur in early spring. Then a great flush of

growth occurs. The density of these rosettes may be very high, i.e. representing 50 or more percent of the ground cover. Such large numbers of plants will increase evapotranspiration losses even though temperatures are still cool.

Future studies will investigate these trends. The data will be used to better evaluate the relationship between productivity and climatic factors. It is hypothesized the consumptive use information will be especially valuable for dry years when little vegetative growth is produced, and for wet years when annuals are abundant.

Summary

The flora and plant communities of the Kaiparowits Basin are more related to the vegetation of the Great Basin than to the vegetation of the Sonoran Desert or Colorado Plateau. About half of the Kaiparowits Basin is dominated by pygmy conifers and 40 percent by saltbush communities which are characteristic of the Great Basin.

Most of the soils lack pedogenic horizons and are either sands, water deposited sandy loams, or shales. In general the sands are non-saline and the clays heavily laden with soluble salts.

The general aspect of the vegetation is semi-desert shrub, woodland, or steppeland, each of which may have a mixture of cool and warm season understory species. Even the grasslands have a shrubby aspect because of the importance of Mormon tea in these communities.

Winter precipitation, i.e. that received from October through March of the following year, is significantly higher than that received in July - September or April - June, and is the most reliable source of moisture for

plant growth.

Predictive equations are presented to show the relationship of the number of species, cover, and composition of the basic life forms to precipitation. The vegetation of the steppelands is the most responsive to increased precipitation and that of pygmy forest is the least responsive. This means that the likelihood of revegetation projects succeeding on pinyon-juniper woodlands of the Kaiparowits region is low. And because of the variability in precipitation more information is required to predict the success of revegetation in the steppe communities, especially those at the lower elevations on Smoky Mountain and Nipple Bench.

Of the woody species pinyon, blackbrush, and spiny hopsage seem to be key species which can be used to monitor environmental quality and the long term effects of climate upon the vegetation. Precise and accurate data related to the current annual growth can be obtained from these species.

On the other hand precise data on the productivity of Mormon tea, annulus, and most perennial grasses is difficult to obtain because they are very susceptible to weathering and because of the time required to clip the plants, especially in dry years when little if any vegetative growth is produced.

It is hypothesized that consumptive water use is an accurate means by which the response of vegetation to climatic parameters can be measured. Theoretical data for blackbrush communities which need to be tested against field data are presented.

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Fig. 1-4.1. Study sites for BYU environmental baseline studies

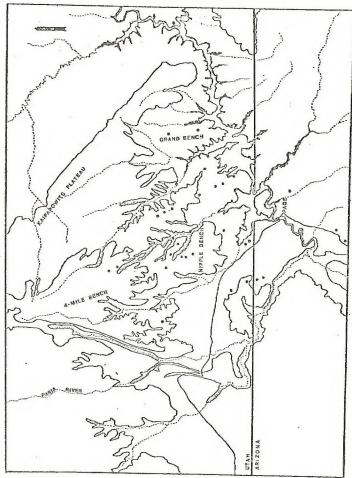
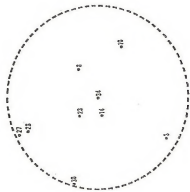


Fig. 1-4.2. Geologic profile of benchlands

1. Kaiparowits Formation
2. Wahweap Sandstone
3. Straight Cliffs Formation
4. Tropic Shale
5. Dakota Sandstone
6. Entrada Sandstone
7. Navajo Sandstone
8. Chinle and Moenkopi Formation
9. Kaibab Limestone and Cutler Group

Geologic profile of benchlands

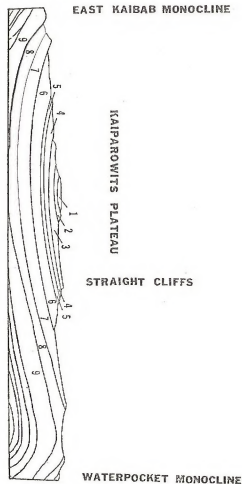
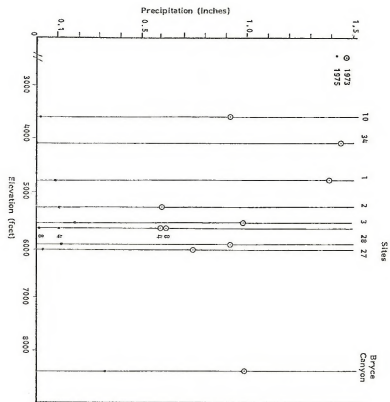


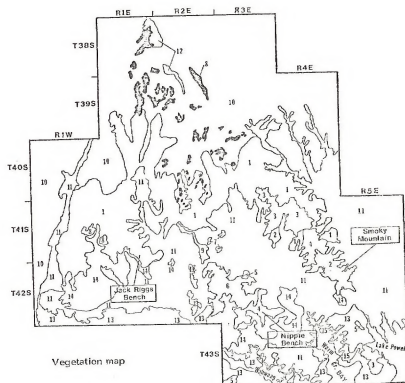
Fig. 1-4.3. Variability of precipitation as influenced by elevation.

IX-622



Map Units	Symbol	Percentage of Area on Map
Saltbush Communities		39.9
Mat atriplex	14	4.7
Shadscale-Mormon tea	11	31.6
Shadscale-galleta grass	7	0.1
Mixed shrubs with grasses	9	0.2
Mixed shrubs-galleta grass	6	1.5
Badlands	12	0.4
Slickrock	15	0.6
Steppe Lands		10.6
Blackbrush	5	0.2
Blackbrush-spiny hopsage	2	1.1
Spiny hopsage-blackbrush	4	1.3
Grasslands	13	6.1
Sagebrush	8	1.9
Pygmy Forest		50.5
Pinyon-Juniper	10	33.1
Scattered Juniper	3	1.5
Rimrock Pinyon-Juniper	1	15.8

Fig. 1-4.4. Legend of mapping units for vegetation map.



[illegible]

Fig. 1-4.5. Species that characterize each study site

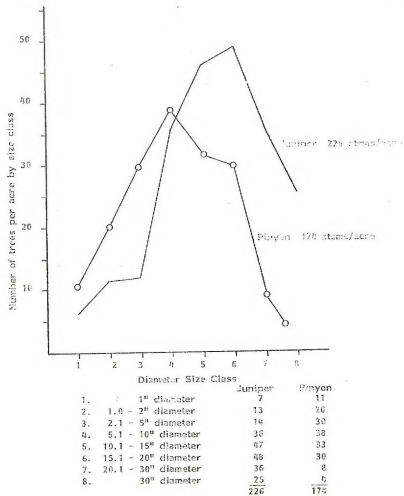


Fig. 1-4.6. Population dynamics of tree overstory
Four Mile Bench

Precipitation Patterns Throughout Moisture Year

Site 1

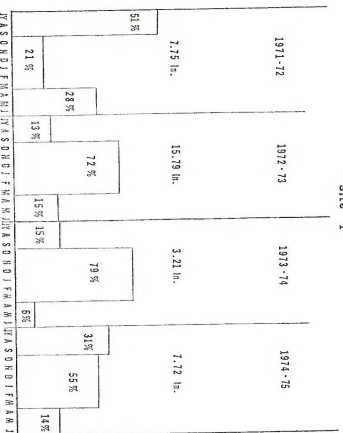
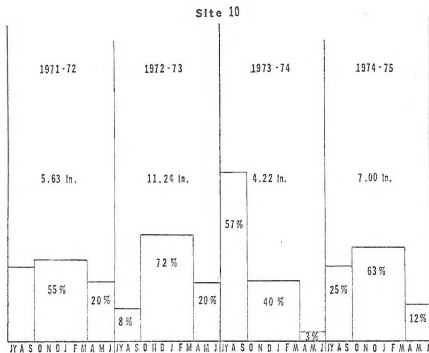


Fig. 1-4-7. An old juniper tree which has split and fallen.

Precipitation Patterns Throughout Moisture Year

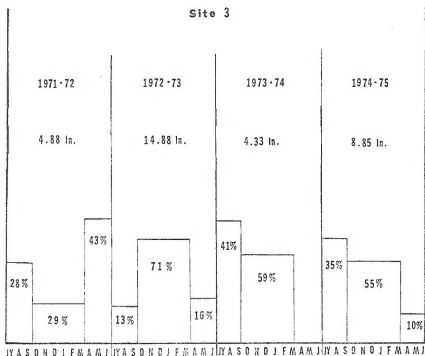


Figs. 1-4, 8 - 4, 19. Precipitation patterns throughout moisture year

Figure	Site	Habitat-type
4, 8	1	Grass-Mormon tea-Yucca-Vandeweg
4, 9	10	"
4, 10	3	Mixed Grasses
4, 11	30	Habitat-type
4, 12	30	Saltbush Community
4, 13	8	Blackbrush
4, 14	23	Habitat-type
4, 15	8	Blackbrush-Spring Hopsane
4, 16	18	Habitat-type
4, 17	28	Sagebrush Community
4, 18	2	Scattered Juniper
4, 19	27	Pinon-Juniper

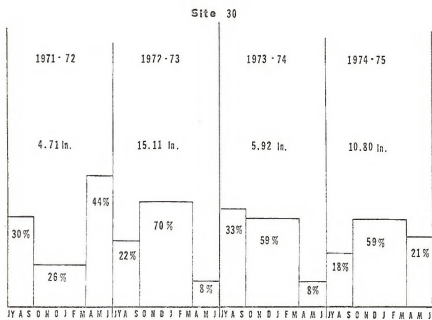
06

Precipitation Patterns Throughout Moisture Year



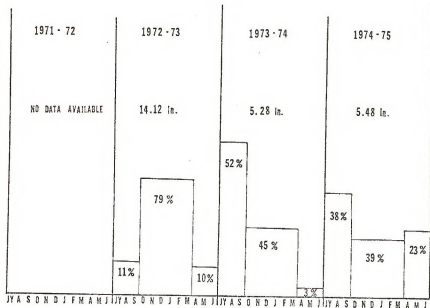
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Precipitation Pattern Throughout Moisture Year



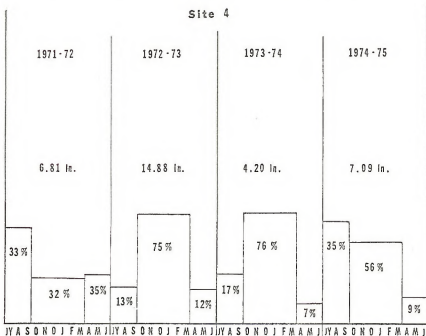
Precipitation Pattern Throughout Moisture Year

Site 34

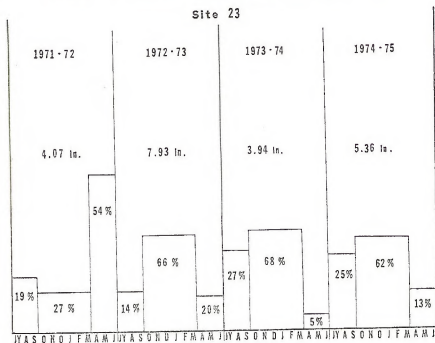


Precipitation Patterns Throughout Moisture Year

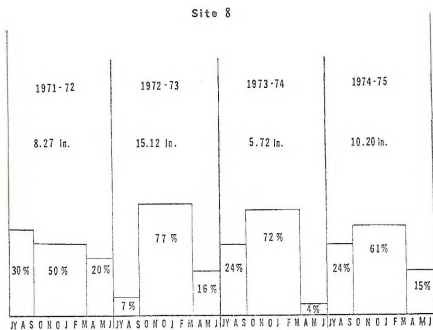
Site 4



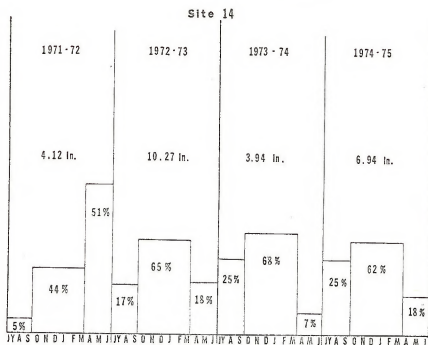
Precipitation Patterns Throughout Moisture Year



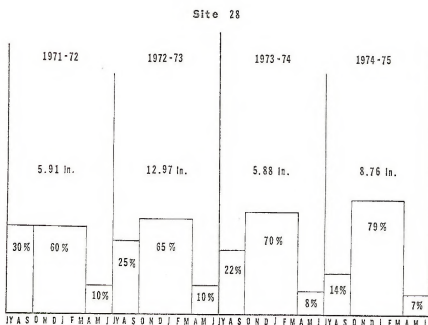
Precipitation Patterns Throughout Moisture Year



Precipitation Patterns Throughout Moisture Year

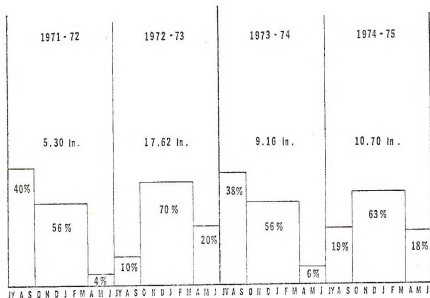


Precipitation Patterns Throughout Moisture Year



Precipitation Patterns Throughout Moisture Year

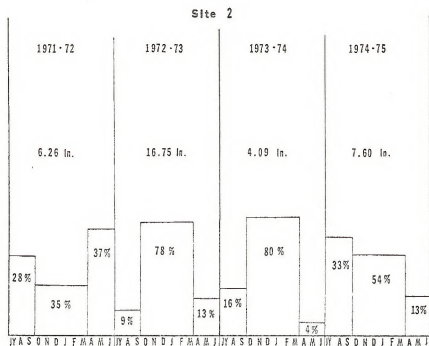
Site 27



Site	Number of Species	Total Percent Cover	Percent composition of:			
			shrubs	non-woody perennials	annuals	trees
3	$y = 1.30X + 10.66$	$y = 4.80X + 28.58$	$y = -X + 19.88$	$y = -4.80X + 102.42$	$y = 5.80X - 22.30$	--
30	$y = 1.25X + 10.11$	$y = 4.83X + 27.07$	$y = -0.96X + 28.53$	$y = -0.58X + 61.72$	$y = 1.54X + 9.75$	--
1	$y = 2.11X + 0.61$	$y = 2.00X + 27.38$	$y = -1.62X + 49.53$	$y = 0.12X + 36.04$	$y = 1.49X + 14.43$	--
10	$y = 1.96X - 0.04$	$y = 4.12X + 1.42$	$y = -9.09X + 124.18$	$y = 1.96X - 5.04$	$y = 7.13X - 19.14$	--
4	$y = 1.49X - 4.13$	$y = 1.20X + 30.91$	$y = -4.46X + 128.38$	--	$y = 4.46X - 28.38$	--
23	$y = 9.84X - 50$	$y = 8.85X - 33.10$	$y = -4.92X + 80$	$y = -4.92X + 70$	$y = 9.84X - 60$	--
8	$y = 2.34X - 7.32$	$y = 5.59X + 7.76$	$y = -3.07X + 66.35$	$y = -1.02X + 40.45$	$y = 4.09X - 6.80$	--
14	$y = 1.30X + 14.64$	$y = 2.98X + 11.14$	$y = -4.39X + 76.09$	$y = 1.63X + 11.30$	$y = 2.60X + 13.28$	--
28	$y = 1.98X - 2.35$	$y = 2.55X + 18.52$	$y = -0.72X + 53.49$	$y = -0.72X + 33.49$	$y = 1.44X + 13.02$	--
2	$y = 2.00X + 4.47$	$y = 1.45X + 33.53$	$y = 0.29X + 22.21$	$y = -1.24X + 64.76$	$y = 0.38X - 1.39$	$y = 0.57 + 14.42$
27	$y = 0.81X + 32.30$	$y = 0.36 + 26.11$	$y = 0.97X + 0.84$	$y = -0.08X + 1.43$	--	$y = -0.97 + 98.16$

Fig. 1-420. Predictive equations of several parameters in relation to precipitation [x is the precipitation (inches) received from July through June, and y is the parameter to be estimated].

Precipitation Patterns Throughout Moisture Year



	Sites												
	1	2	3	4	8	10	14	23	27	28	30	34	
Total number of species	34	38	30	18	28	22	28	28	18	22	29	20	
Total cover	59	57.8	100	48.8	92.2	47.7	41.7	37.1	32.4	62.7	100	28.4	
Percentage composition													
Trees		24							80.6				
Shrubs	24	22	7	61	19	20	31	51	2.2	41	13	21	
Succulents		5				2			5.2				
Cool season grasses	24	4	10			17	11	3		10	34	5	
Warm season grasses	2	25	34		24		18	28		11	20	16	
Annual grasses		4	5			8						6	
Perennial forbs	1		29	20	35	44	10	8	5.2	24	15	32	
Annual forbs													
Percent comp.	50	16	15	19	22	9	30	10	6.6	14	18	20	
Percent cover	30.0	9.2	15.0	9.3	20.3	4.3	12.5	3.7	2.2	6.8	18.0	5.7	
Number species	27	28	20	13	22	14	19	20	13	15	20	11	

Fig. 1-4.21. Vegetational parameters for 1973 growing season.

Vegetation type and site	Ppt (in)	cm/in	Ppt (in)	cm/in	Ppt (in)	cm/in
	1971-72	1972	1972-73	1973	1973-74	1974
Grassland			Mormon tea	<i>Ephedra viridis</i>		
Site 3	4.88	0.30	14.88	0.86	4.33	3.03
Site 30	4.71	0.30	15.11	0.90	5.92	2.03
Dunes						
Site 1	7.75	0.03	15.79	0.94	3.21	1.09
Site 10	5.63	0.17	11.24	1.60	4.22	0.95
Woodland						
Site 2	6.26	0.03	16.75	0.89	4.09	2.44
Site 27	5.30	0.05	17.62	0.85	4.85	0.41

Fig. 1-4.23. Amount of current annual growth (cm) of Mormon tea per inch of precipitation

Location and site	Size of plants	Freq. %	Cmp. %	Cover %	gm/96 ² sq. ft.
Cedar Mountain Site 3	Small	15	7	6.7	56
Remona Mesa Site 10	Large	21	8	6.0	393
Cedar Mountain Site 1	Medium	55	12	7.0	412
Brigham Plains Site 30	Medium	65	13	13.7	575

¹ Size of plants: Small - 1 sq. ft.
Medium - 5 sq. ft.
Large - 10 sq. ft.

² gm/96 sq. ft. are equivalent to pounds/acre.

Fig. 1-4.22. Production of current annual growth of *Ephedra viridis*: 1973

	1974	1973	1972	1971	1970	1969
	mm					
Site 27	2.5	31.1	28.6	25.9	26.3	26.0
Site 29	2.8	29.3	23.6	19.7	23.7	26.7

Fig. 1-8.25. Average length of leaves of pinyon pine on Four Mile Bench.

IX-534

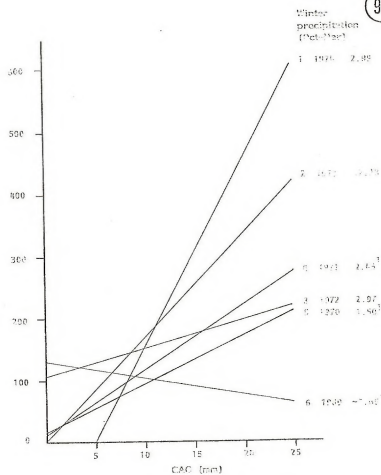


Fig. 1-8.26. Leaf production of pinyon pine correlated with current annual growth (CAG); Site 27.

From BLM records, Kanab District Office, Kanab, Utah.

Vegetation	Site	Percent available moisture (dry weight basis)	Bulk density	Rooting depth (inches)	Inches of available moisture	Infiltration cm per minute
Grassland	3	4.9	1.60	14.2	1.11	0.84
	30		1.44			1.11
Dunes	1	4.1	1.63	18.1	1.21	1.85
	10	1.2	1.50	18.9	0.34	1.67
Woodland	2	4.9	1.54	24.0	1.81	1.01
	27	1.9	1.35	9.4	0.24	0.75
Blackbrush communities:						
Blackbrush Habitat-type	4	3.6	1.60	24.0	1.38	0.64
	23	2.0	1.43	12.2	0.35	1.05
Blackbrush-Spiny Hopsage	8	2.2	1.45	31.1	6.98	1.02
	14	4.6	1.45	11.6	0.76	0.53

Fig. 1-4.28. Relationship of soil factors to available water.

Vegetation type and site	Ppt (in)	cm/in	Ppt (in)	cm/in	Ppt (in)	cm/in
	1971-72	1972	1972-73	1973	1973-74	1974
Blackbrush habitat-type						
			Blackbrush <i>Coleogyne ramosissima</i>			
Site 4	6.81	0.01	14.88	0.29	4.20	0.24
Site 23	6.10	0.09	7.93	1.51	3.94	0.38
Blackbrush-spiny hopsage habitat-type						
			Spiny Hopsage <i>Grayia spinosa</i>			
Site 8	8.27	0.26	15.12	0.76	5.72	1.47
Site 14	4.12	0.46	10.27	1.03	3.94	0.84

Fig. 1-4.27. Amount of current annual growth (cm) of selected shrubs per inch of precipitation

THE UNIVERSITY OF UTAH
SALT LAKE CITY 84112

DEPARTMENT OF BIOLOGY

November 6, 1975

Mr. Paul L. Howard
State Director
Bureau of Land Management
P. O. Box 11505
Salt Lake City, Utah 84147

Dear Mr. Howard:

Previously I presented individual testimony relating to the draft Environmental Impact Statement on the Kaiparowits Project. In that testimony I stressed the lack of an adequate inventory of plant species in the Kaiparowits Impact area, and suggested that threatened or endangered species might well be expected to occur in this area.

Since that time I have been able to obtain additional information on these points. Plant collection data obtained by Brigham Young University biologists demonstrate that the Kaiparowits area does, in fact, contain considerable numbers of threatened or endangered plant species. The recent Smithsonian Report on Endangered and Threatened Plant Species in the United States (a publication which I note does not appear in the bibliography for Chapter II of the EIS) was prepared in haste, and without the counsel of a number of Utah plant scientists with long field experience in the state. Brigham Young University biologists have added significantly to that list.

Although there will undoubtedly be borderline cases, the following estimate of threatened or endangered plant species in the Kaiparowits area is probably reasonably accurate. The area under consideration involves a strip about 30 miles wide lying on a southwest-northeast axis about 60 miles long superimposed on the Kaiparowits Plateau. Inasmuch as the draft EIS suggests significant impact as far as 100 miles from the site, this should surely constitute a critical impact area.

Of the approximately 841 plant species in this area, 42 (or about 5 percent) are threatened or endangered. These 42 species constitute fully 20 percent of all the threatened or endangered plant species in Utah. If one includes the whole of Kane County the list is expanded to 59, plus an additional 3 probably already extinct.

According to the "Endangered Species Act of 1973" (PL93-205), the Congress has declared (Sec. 2c) "...that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of this Act."

Mr. Paul L. Howard
November 6, 1975
Page 2

Inasmuch as no inventory of plants is given in the draft EIS, there is, of course, no mention whatever of the relatively numerous threatened and endangered plant species occurring in the Kaiparowits area. I can only conclude that this aspect of the draft EIS is woefully, if not catastrophically, inadequate.

Furthermore, the Utah prairie dog, an endangered animal, is mentioned as occurring within a half mile of the proposed quarry site, but no further comment is made. Is an EIS to be only a compendium of data without analysis? I would like to know how you, as the Director of the BLM in Utah, propose to carry out your mandate as instructed by the Congress, with respect to the Utah prairie dog and the plants mentioned above?

Some of the endangered plant species are extraordinarily vulnerable to complete extirpation. For example, the entire known distribution of a mustard species (Lesquerella tumulosa) is limited to approximately a half acre adjoining an active road-building quarry near Cannonville.

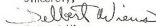
I would also ask, where are inventory data for such organisms as mosses, algae, or fungi? The present data on insects is also shockingly inadequate. With Ph.D. holders in biology in great excess such basic information could easily have been compiled in the course of several field seasons at comparatively little cost. I fervently hope that other sections of the Kaiparowits draft EIS are prepared in greater detail and the data subjected to analysis.

Only in the legend to Illustration 7 was I able to find reference to the existence of permanent study plots. These are of critical importance and must be strategically located if they are to be utilized to monitor the effects of potential environmental degradation. The physical and biological characteristics of such plots must be studied with meticulous detail.

The high proportion of threatened and endangered plant species, and the general lack of adequate overall biological inventories gives strong cause for rejecting the draft EIS in its present form. Furthermore, arid regions generally have a highly fragile ecology. Coupled with the outstanding scenic and recreational values of the Kaiparowits region, which will necessarily be impaired by large industrial and population expansion argues strongly against approval of the entire project.

Thank you for your consideration of this statement. I speak only as an individual and represent no organization.

Sincerely,


Delbert Wiens
Professor

DM/vbm

cc: Secretary of the Interior
Utah Congressional Delegation

IX-635

University Of Utah Research Institute
Research Park
391 Chipeta Way
Salt Lake City, Utah 84108
Phone (801) 581-5226

November 7, 1975

Paul Howard, Director
Bureau of Land Management
Federal Building
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

We have read with great interest the Draft Environmental Impact Statement on the Kaiparowits project. It seems appropriate to address the distribution of mercury from the power plants in a more analytical fashion.

Concern has frequently been expressed over mercury release from coal-fired power plants and its accumulation in water systems. This same concern was expressed in the Kaiparowits draft environmental impact statement, as well as in the abstract of the report of Standford, et. al. (1), June 1973, which states, "The extent of this augmentation and its effect on Lake Powell principally depends on the actual mercury content of the coal, the degree to which this mercury enters the lake drainage and the movement and bioamplification of mercury within the system." This statement refers to the degree to which mercury enters the lake drainage.

Assuming all the mercury is emitted as vapor, calculations of the mercury emissions and the actual gas volume show that the concentration of mercury vapor will be about 3.5 micrograms per cubic meter in the stack gas at the stack temperature. On cooling to ambient temperatures (about 65°F) and diluting with only 500 volumes of air, the concentration of mercury will be approximately 9×10^{-3} micrograms per cubic meter. At the primary maximum 24 hour SO_2 standard (0.14 ppm), the mercury concentration will be about 1.5×10^{-3} micrograms per cubic meter.

The vapor pressure of mercury at 65°F from standard handbooks (such as Lange's Handbook of Chemistry, page 1465) corresponds to 1.4×10^4 micrograms per cubic meter which is therefore, the saturation concentration of mercury in the atmosphere. Thus, before condensation can occur at the 24 hour SO_2 standard the atmosphere will hold almost 10 million times more mercury than the estimated atmospheric concentration will be from a coal-fired power plant like Kaiparowits. The only mechanism therefore, for mercury removal from the atmosphere will be absorption on leaves, soils and water which is highly unlikely against the driving force of mercury evaporation. It would be like condensing water on a hot stove.

Mercury emissions could cause condensation if the very small concentration emitted was sufficient to saturate the atmosphere at low temperatures. The magnitude of baseline mercury vapor concentrations need to be determined, but are not expected to be high enough for this effect.

Unless some unusual or unique mechanisms can be presented for deposition of mercury against the driving force of vaporization, significant quantities of atmospheric mercury cannot be injected in the Lake Powell ecosystem by operation of Navajo, Kaiparowits or other projected coal-fired power plants in the Four Corners Air Quality Control Region with similar coal. Certainly the effects of natural mercury in the environment will far exceed any contribution from coal-fired power plants. The threat of mercury additions to the environment by operation of the coal-fired power plants, are not of sufficient magnitude therefore, to justify any expense for mercury removal unless the atmosphere will have baseline concentrations near saturation.

- (1) D. R. Standford, L. O. Potter and D. E. Kidd, "Mercury in the Lake Powell Ecosystem," Lake Powell Research Project Bulletin, No. 1, June 1973. Sponsored by National Science Foundation RANN program.

Would you please include this comment with the Final Environmental Impact Statement? Let us know if there are other questions.

Sincerely yours,

Wayne D. Ursenbach
Assistant General Manager

WOU/sc

Jafford, A4
6 Nov 75

-2-

Paul L. Howard, State Director
Bureau of Land Management
Federal Building
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

The Arizona Wildlife Federation has asked me to comment on the Draft Environmental Impact Statement Kaiparowits Project. I am grateful for the time extension allowed for comment, because even with the excellent organization of the statement, it is cumbersome with its five volumes. I am impressed with the completeness of the statement and believe it is a fair analysis of the impact that the project, if allowed, would have on the wildlife resources in the four state areas.

There is one criticism which may or may not be valid. I am a hunter and sportsman and represent here the largest group of sportsmen-conservationists in Arizona. The Arizona Wildlife Federation supports responsible wildlife management and believes the various state game and fish departments have accepted this responsibility well. I resent the several undocumented statements such as (Ch I-180) "the small deer herd in the project area apparently results from overhunting". This is inferring an irresponsibility on the part of the agency that manages this deer herd, and if it is indeed the case, it should be documented. If supporting data is present in the statement or the appendix, I could not locate it.

Figure 19 (Ch III-79) lists the yearly amount of mercury in the unprecipitated fly ash at 8,760 pounds, distributed in a 30 mile radius from the proposed generating plant. Much of this would end up directly, or indirectly through natural soil erosion, in Lake Powell. The storage of precipitated fly ash at the head of a major drainage into Lake Powell also increases the probability of trace element contamination. The deposition of salt drift from the cooling towers decreases the probability of establishing and maintaining a vegetative cover on the ash dump. This increases the probability of the erosion of thousands of tons of mercury and other trace elements into Lake Powell during and after the life of the proposed project.

This possible, indeed highly probable, increase in the mercury content of Lake Powell would be sufficient to render the lake unsuitable for sports fishing. This adverse impact is unacceptable to the Arizona Wildlife Federation. The Bureau of Land Management, before granting approval for a project such as Kaiparowits, must by law, recognize environmental effects and avoid unacceptable damage. The first has been complied with, the environmental effects have been recognized. The damage to the aquatic food chain with the probability of millions of man-days of sport fishing lost is unacceptable, and if it cannot be avoided, the proposed project must be denied.

With a lack of a regional or national energy policy, the regional impact caused by successive energy projects is cumulative. A moratorium, or delay in granting approval for this project may allow such a policy to be implemented. In addition, a moratorium may allow time for refinements in scrubber techniques and ash disposal which would avoid the unacceptable impact of mercury contamination in Lake Powell and the Colorado River below the lake.

The alternative of a generating plant outside the Kaiparowits area would avoid this impact, and would lessen to some extent the impact on wildlife of an increased human population in an area that is now relatively isolated from human use. It would also lessen the impact of transmission lines through previously undisturbed and critical wildlife habitat, especially in the Arizona Strip.

Energy conservation measures in a community will be implemented when the results of coal produced electricity (fly ash, gaseous emissions etc.) have a direct impact on that community. California clean air standards apparently prohibit coal fired energy conversion systems, although the bulk of the electricity to be produced by the Kaiparowits Project will be transmitted to Southern California. One wonders what the projected energy demand would be if the pollutants were included with the electricity.

The unavoidable damage to the wildlife resource in Arizona which would be caused by the Kaiparowits Project is unacceptable to the Arizona Wildlife Federation. As proposed, the project should be denied.

Thank you for allowing the AWF to comment on this draft environmental impact statement.

Sincerely,
Steve Bingham
Steve Bingham, Chairman
BLM Lands Committee
Arizona Wildlife Federation
P.O. Box 1769
Phoenix, AZ 85001

IX-638



WILDERNESS WORKSHOP of COSEC

97



WILDERNESS WORKSHOP of COSEC

97

Mr. Paul L. Howard
State Director
Bureau of Land Management
125 S. State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

Enclosed please find the Wilderness Workshop's response to the Draft Environmental Statement for the Kaiparowits Power Project. Thank you for the opportunity to comment on this important plan.

Yours truly,

Robin Ross
Robin Ross

IX-639

RESPONSE TO THE DRAFT ENVIRONMENTAL STATEMENT
KAIPAROWITS POWER PLANT

The Wilderness Workshop of the Colorado Open Space Council wishes to respond to the Kaiparowits DEIS since we are deeply concerned about the environmental effects of such a proposal.

SITE

First of all, we are opposed to the planned location of the Kaiparowits project. Within a 250 mile radius of the proposed site are eight national parks, 26 national monuments, three national recreation areas, two national historic sites, and one national memorial-or 1/5 of the total acreage administered by the National Park Service. This area also contains three BLM primitive areas, several state parks, Indian reservations and defacto wilderness areas such as the Escalante Canyons. This will be Utah's first major power plant soon to be followed by three more, the expansion of an existing one and the building of a coal gasification plant- due to the state's vast energy resources. The project would be incompatible with the fundamental purpose of the Park Service which according to the National Park Service Act is to "conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner as will leave them unimpaired for the enjoyment of future generations."

AIR QUALITY

The plant's most severe impact to the entire region will be visual air pollution created by smokestack emissions. Each day, 12.2 tons of particulates, 34.3 tons of SO₂, and 120 tons of NO₂ will be emitted. There will be no equipment to remove nitrogen oxide which under certain conditions forms a yellow-brown smog layer.

The DEIS repeatedly states that "data is not available to assess the effects of the existing Navajo power plant on the air quality of the region." However, the Southwest Energy Study conducted by the Department of Interior predicted "no additive effects from the emissions by one plant on that of another if the plants are separated by 60 miles or more." Since the proposed Kaiparowits plant and the Navajo plant are only 36 miles apart, we can expect severe air quality degradation in the region.

WATER RESOURCES

Withdrawal of nearly 50,000 acre-feet of water per year from Lake Powell for consumptive uses, would have a salt-concentrating effect in the Colorado River and compound the present salinity problem. The use of this water for power generating purposes precludes its use for agriculture, recreation, watershed, and other purposes. Additionally, fracturing of rocks by mining and subsidence would create connecting flows between fresh and saline aquifers thereby destroying the quality of local ground water. Also, according to the DEIS, ground water used to

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supply the new town would "lower water levels in existing wells resulting in conflicts with existing water rights."

VEGETATION

The power plant's cooling towers will use Colorado River water which is high in salinity. The drift of moisture from these towers will deposit salt on 19,000 acres surrounding the plant. The acreage will receive 1/2 pound to 250 pounds of salt each year thereby stunting or killing much of the natural vegetation. According to the DEIS, "salt accumulation in the soil would not become stable for about 78 years, which is nearly double the expected life of the project."

TRANSPORTATION SYSTEMS

Limestone for the SO₂ pollution control devices will come from a quarry north of Bryce Canyon National Park. The trucks hauling the limestone will make 30 trips a day through the park in addition to the 40 trips now being made by oil tankers. Together these uses have demanded a need for 44 miles of widened roads.

WILDERNESS STATUS

According to the DEIS, "intensive recreational use could cause an irreversible commitment of presently wild to semi-wild recreation land to intensified uses and prohibit establishment of future wilderness and primitive areas." Also, the aesthetics of the region will change radically as 600 foot smokestacks from Kaiparowits obstruct the open mountain views. Wilderness status will be completely out of the question for lands in the immediate surroundings of the plant.

ALTERNATIVES

The Wilderness Workshop opposes the construction of the Kaiparowits Power Project due to all of the adverse impacts discussed above. Instead, we recommend a moratorium on the proposal until a regional energy study is completed. This delay should provide time for monitoring, environmental studies, and observation of trends in the market and impact areas. Additionally, a delay could provide time for technologic improvements.

We would hope that any shortage in electrical energy resulting from the delay would provide the necessary incentive for industry or government to pursue more environmentally sound alternatives. We oppose the continuing commitment of our government to authorize the construction of fossil-fuel plants such as Kaiparowits. Instead, "a commitment to develop and implement our most abundant energy source, the sun, should become a national priority." (Canyon City Council-Kaiparowits Alert)

KANE COUNTY
OFFICE OF THE COMMISSIONER

[Handwritten signature]

Kane County Commission

November 7, 1975

Mr. Gerald R. Ford
President of the United States
The White House
Washington, D.C. 20500

Dear Mr. President:

The Kane County Board of Commissioners has gone on record in support of the Kaiparowits Power Project. The people of our County overwhelmingly support this project and wish to see the construction proceed at the earliest possible date.

We urge you to use your power and influence with the Department of Interior to hasten the approval of this project.

Very truly yours,

Kane County Commission

by *[Signature]*
Merrill R. MacDonald, Chairman
Sterling Griffiths, Acting Chairman

MRM/rv

cc: Mr. Thomas Kleppe, Secretary of the Interior
Mr. Paul Howard, Utah State Director of Bureau of Land Management

IX-640



TUCSON AUDUBON SOCIETY

P.O. BOX 3981

TUCSON, ARIZONA 85717

November 10, 1975.

Mr. Paul L. Howard,
Bureau of Land Management,
125 South State Street,
Salt Lake City, Utah 84111.

Re: Kaiparovits Draft Environmental Impact Statement.

Dear Mr. Howard:

At the public hearing on this subject in Phoenix September 17, 1975, Tucson Audubon Society testified both for itself and through the Arizona Audubon Council of which it is a member. T.A.S. reiterates the views expressed then, and now submits the following additional statement, ratified by the members present at its regular monthly meeting held this day. We also attach petitions bearing 184* signatures of persons who endorse this letter, with the request that this entire correspondence be made a part of the official hearing record.

Tucson Audubon Society recommends that:

1. The Project not be approved because of the adverse environmental impacts on the public lands affected in the vicinity of the proposed power plant, as set forth in the Draft Environmental Impact Statement.

If the Project is approved:

2. The transmission lines between Kaiparovits and Eldorado and Hohave should use only existing corridors. This would reject the alternate corridor across the "Arizona Strip", which lies south of the proposed route along the existing Navajo-Cullough 500 KV line. The Arizona Strip alternate is unnecessary, and would be detrimental to wildlife, to its habitat and to scenic qualities in an otherwise unspoiled area.

3. All transmission corridors should avoid proximity to established wilderness or primitive areas, or areas under consideration for such designation. The location and description in the DELS of temporary and permanent access roads to be constructed to those corridors are too vague to risk impingement on existing or potential future preserves.

As an alternate to the Project, T.A.S. favors relocating the power plant to a site along the lower Colorado River below Hoover Dam, as discussed in Chapter VIII of the DELS. This would have the advantages of: a) avoiding air pollution over the scenic public lands of Utah and northern Arizona; b) avoiding the adverse impacts of long new power transmission lines; and c) using water of the Colorado River which is allocated to California, the prime beneficiary, instead of Utah's water which will become in short supply before the turn of the century.

Respectfully submitted,

Harriette Barker
Harriette Barker, President.

* See note attached.

conservation

education

recreation

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This note is to explain part of the attached petitions.

The meeting at which the petitions were circulated for signatures was held in a classroom auditorium at the University of Arizona. There had evidently been a biology class in that room earlier in the day, at which an attendance record was circulated, then left uncollected on a clipboard. It appears that a person attending the Audubon meeting must have found the clipboard and starting circulating it in error, believing it to be the Kaiparovits petition.

Of the 184 total signatures, 43 appear on the class attendance record: 32 are on the back of the page, 11 at the end of the front of the page. These 43 persons were unaware that addresses are called for on the petition form, and we have supplied them after-the-fact to the best of our ability. Those lacking addresses cannot be further identified, except that they attended the meeting.

101

"We, the undersigned, have read or heard the position letter of Tucson Audubon Society dated November 10, 1975 concerning the Kaiparowits Draft Environmental Impact Statement, and do endorse that letter.

NAME _____

ADDRESS

101

Elizabeth Cummings	3010 East 6th Avenue RS 710
Colleen P. Lance	Rt 8 Box 314-A Tucson RS 710
Harvey W. Lance	Route 8, Box 314-A; Tucson RS 710
Angene Schmitt	2002 East 3rd St Tucson RS 719
Robert M. Schmitt	5528 N. La Casita Dr, Tucson RS 718
Therese W. Schmitt	5528 N. La Casita Dr, Tucson RS 718
Robert R. Rula	2448 E. Adams St. Tucson RS 719
Corabelle Jean Rula	Box 1677 RS 615
Ueta Becker	980 N. 217th Ave, Suite R45, Tempe, AZ 85284
John G. Cook	615 La Franklin St, Tucson RS 708
John G. Schmidt	511 Pinedale Lane, Suite 200, Tucson RS 719
John M. Schmitt	511 Pinedale Lane, Suite 200, Tucson RS 719
Ernie Moore	421 W. Spruce Valley Drive
Ruth C. Hensley	6701 S. Broadway, Suite 200
GB Hawley	6101 E. Roosevelt Ave

1X-642

I, the undersigned, have read or heard the position letter of Tucson Audubon Society dated November 10, 1975 concerning the Kaiparowits Draft Environmental Impact Statement, and do endorse that letter. (1)

TABLE 12

ADDRESS

101

Roy L. F. School	5460 General Ave Tucson	85704
Shade Bullock	2760 N. Cornsain Vally	85715
Bernice Cantrell	645 N. J. Ave Tucson	85711
Samuel C. Cantrell	855 E. 2nd Tucson	85720
Agnes K. Cantrell	581 E. 2nd Tucson	85710
Arthur K. Cantrell	775 N. 2nd Tucson	85710
Robert W. Walker	585 N. Tartan Rd Tucson	85710
Edith Cantrell	6938 Canyon Green Circle	85704
William Cantrell	6938 Canyon Green Circle	85704
Mrs. C. A. Swadlow	6937 " " " "	
Mrs. B. B. Swadlow	6960 E. 7th Tucson	85704
Loretta B. Martine	7360 N. La Oleta Ave Tucson	
John K. Martine	7346 N. La " " " "	
Mary Millman	3525 W. Calle Torada Tucson	85705
Arthur Millman	2525 W. Calle Torada Tucson	85705
LEONA JONES	1281 E. HAYDEN RD Tucson	85719
W. W. K. Jones	4150 E. Sun Circle Apt Tucson	85712
Georgene E. Jones	" " " " "	
Harriette N. Barber	6302 S. Tucumcillo Tucson	85706

We, the undersigned, have read or heard the position letter of Tucson Audubon Society dated November 10, 1975 concerning the Kaiparowits Draft Environmental Impact Statement, and do endorse that letter.

NAME _____

ADDRESS

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(Name H. Weyler) 301 Spring Valley Pl. Tucson 85704
 Gustave M. Zolner 5741 E. Glendale #52 " 85712
 Commander Hanson 2635 Wilbur Way " 85713
 Jimmie F. Fisher 5742 W. Flying Circle " 85713
 Wayne Hanson 5501 E. Flying Circle Tucson 85713
 Karl (John) 5742 Flying Circle " 85713
 Bonnie Hansen 5353 S. Camino Pint 85706
 BOSS LADD 5353 S. Camino Pint 85706
 Ernest J. Severs 4265 E. S. Highway 85715
 Mary M. Moore 204 E. E. Road " 85710
 Alexander J. Clegg 2050 20th Postal City 85632
 Emma E. Miller 5344 S. Tucson Blvd Tucson 85700
 Virginia Cutler Box 156 Postal City 85632
 E. M. Cutler Box 156 Postal City 85632
 Helen Warden 9520 Bush Hill Pl. AZ 85715
 Helen C. Wright 3301 E. Sonora St Tucson AZ 85716
 Simon P. Holland 7146 N. San Maria St Tucson AZ 85704
 Blair Harrison 5165 W. Long Street Tucson Ariz 85713
 Laura Wickham 5540 W. Barry St, Tucson, Ar. 85711
 Wayne Harrison 5745 W. San Agustine Tucson AZ 85712
 Paula M. Wrenschel 3605 N. Fairview Tucson 85705
 Gerald Thompson 30151 140th St. #2 Tucson Ariz 85719
 Alice H. Hart 5165 S. Sonora St Tucson Ariz 85716

IX-643

We, the undersigned, have read or heard the position letter of Tucson Audubon Society dated November 10, 1975 concerning the Kaiparowits Draft Environmental Impact Statement, and do endorse that letter.

NAME _____

ADDRESS

101

[illegible]

1540 S. Alta Ave. Tucson 85710

- 115 *Allegoria* } 254 Ascutt E. Mills 3401 N. Columbus Tucson 85711
 116 *West* } 205 Hacienda G. Hodge 3446 N. Roman Rd Tucson 85710
 117 *Allegoria Sanders* } 1814 N. Tanager Tucson 85711
 118 *Bill Sanders* } 4442 E. 6th St. Tucson, Ariz. 85711

118 *Ruby Fathman* 5752 Fairmount Ave. Tucson 85712

121 *Ala. Army* } 725 E. University Blvd Tucson 85719

122 *Ther. S. Schaefer* }
 123 + 4 *Mrs. Mrs. H.R. Stockand* 2731 E. Avenida de Rinde Tucson 85718

125 *Douglas B. Burt* 1829 E. Lathrop Tucson 85719

126 *W. J. Miller* 3701 N. Cantor Blvd Tucson 85718

127 *W. J. Miller* 2557 E. Weller St. Tucson 85714

128 *W. J. Miller* 3636 N. Campbell St Tucson 85719

129 *Dorothy Thomas* 1743 E. University Ave Tucson 85719

130 *W. J. Miller* } 1743 E. University Ave Tucson 85719

131 *W. J. Miller* } " " Tucson 85719

132 *W. J. Miller* } 746 E. 5th St Tucson 85711

133 *W. J. Miller* } 811 W. Lathrop Ave Tucson 85716

134 *W. J. Miller* } 1317 Office 10342, Tucson 85721

135 *W. J. Miller* } 8831 N. Phoenix Ave Tucson 85704

136 *W. J. Miller* } " " " " " "

137 *W. J. Miller* } " " " " " "

138 *W. J. Miller* } " " " " " "

139 *W. J. Miller* } " " " " " "

140 *W. J. Miller* } " " " " " "

141 *W. J. Miller* } " " " " " "

142 *W. J. Miller* } " " " " " "

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145 *W. J. Miller* } " " " " " "

146 *W. J. Miller* } " " " " " "

147 *W. J. Miller* } " " " " " "

148 *W. J. Miller* } " " " " " "

149 *W. J. Miller* } " " " " " "

November 14, 1975

Mr. Paul L. Howard
State Director
United States Bureau of Land Management
P.O. Box 11505
Salt Lake City, Utah 84147

Re: Comments on Kaiparowits Draft
Environmental Impact Statement

Dear Mr. Howard:

1. Inadequate Consideration of Alternatives

The heart of an environmental impact statement is the consideration of a wide range of alternatives to the proposed action and a full assessment of the respective environmental effects of all reasonable alternatives. This full discussion of alternatives is mandated in Section 102(2)(c) of the National Environmental Policy Act and has received strong backing from a large number of courts. The Second Circuit Court of Appeals, in Monroe County Conservation Society v. Volpe, 472 F.2d 693, 697-8 (1972), called the requirement for a "thorough study and a detailed description of alternatives" the "linchpin of the entire impact statement." Analysis of the alternatives must include the "feasibility and impact of the abandonment of the project."

In sharp contrast to these directives the Draft Environmental Impact Statement for Kaiparowits (hereafter "EIS") has a limited and cursory analysis of alternatives which amounts to no more than pro forma project justification which was invalidated in the Calvert Cliffs case (449 F.2d 1109 (D.C. Cir. 1971)). Problems with Chapter 8 (Alternatives) specifically arise in several areas.

Within Utah vast amounts of land are available for development that are currently vacant or nearly so. Some of this land is used for grazing purposes but other land is essentially unoccupied and is not as close to the National Parks, National Monuments, Primitive Areas and Recreation

Areas as are both of the sites considered in any detail by the EIS. Possible general areas include Eastern Utah north or northeast of Arches National Park and Western Utah desert land. While additional costs may be incurred by locating a power plant in these areas as compared to the Kaiparowits Plateau, these trade-offs should have been considered in the EIS, but received no mention. There is no basis for the rationalization that the state water allotment hinges on a Kane County plant site, and that rationalization implies a preliminary conclusion that the alternatives considered in using the public domain should be governed by the existing water right interests of a particular company. Clearly this is no justification for eliminating consideration of such alternative sites within the state.

The basis or process for choosing the sites that were actually reviewed by the EIS was equally defective. First, all the sites considered are within a very close proximity to one another, indicating a preliminary narrowing of the "acceptable area" within which a plant could be located, without any explanation of the factors used, their relative weights or the criteria utilized in making this preliminary site determination. Again, this reeks strongly of project justification for the particular interests of the immediate companies--assuring that the chosen alternatives will preserve their opportunities to exploit their particular pre-NEPA claims to coal and water. In addition, despite BLM's duty under NEPA to prepare the impact statement, it appears to have relied improperly and to a substantial extent on company studies, both to determine the area within which sites would be considered and then to eliminate all but two from serious consideration. Of twenty-two possible sites which have been proposed at one time or another since the middle 1960's only these two have been fully considered and compared in a manner that indicates they are actually alternatives. Of the twenty-two, it is not clear from the Draft EIS whether, or on what basis, BLM narrowed consideration to the sites at Four Mile Bench and Nipple Bench. Rather, it appears that the applicant utility companies have chosen and rejected a number of sites, and BLM simply followed their appraisals without explanation, even agreeing to consider Four Mile Bench as the "site" (I-44), and Nipple Bench as "an alternative." In effect, other possibilities have been disregarded on the basis of the companies' preferences. The two "preferred" sites have been the subject of intensive analysis by company consultants while other alternative sites have received much less attention by the company, and thus also from BLM. Unfortunately, BLM has not filled the gaps here but has followed the company preferences.

This approach has precluded a fair comparison between even the small range of sites evaluated by company consultants. There is no mention of the company's methods of comparing these sites, or the manner in which comparison complied with NEPA's requirements of a

"systematic interdisciplinary approach." If this was not done, BLM has not fulfilled its duty under NEPA. The three sites which BLM apparently considered on its own initiative are discussed in approximately one-half page for all three. Again, a fair comparison of these sites appears to be precluded due to a failure to adequately evaluate and compare them in compliance with NEPA and CEQ Guidelines. See 40 C.F.R. § 1500.8(4):

A vigorous exploration and objective evaluation of the environmental impacts of all reasonable alternative actions . . . is essential. . . . In each case the analysis should be sufficiently detailed to reveal the agency's comparative evaluation of the environmental benefits, costs and risks of the proposed action and each reasonable alternative. (Emphasis added.)

Specifically at VIII-297-298, the BLM fails to disclose its weighting factors for a comparison of some of the proposed plant sites and its only explanation refers the reader to a company study. BLM is clearly responsible for disclosing and defending its weighting factors. On page VIII-297 the BLM reports that participants ranked John Henry Bench second among five sites considered but the total analysis of John Henry Bench in the EIS occupies approximately 1 1/2 pages and refers to a lack of some critical data to fully evaluate it. This pot pourri cannot properly be dignified as a decision-making tool, and reflects a basic and improper decision by BLM to leave the development and consideration of alternatives almost wholly to the companies' initiative.

As to plant sites outside Utah, many of the same problems arise as in the previous section. One problem with this Section is that it was originally drafted by the company. The entire section VIII-301 to VIII-308 fails to seriously discuss or compare the impacts of locating the plant in California, Arizona, Nevada, or Utah, or expanding existing facilities in those areas. Instead the section is limited to certain implementation problems which might be encountered in developing such alternative sites. A proper analysis would explain and compare the impacts of each of these alternatives, including comparison with the Utah plant sites discussed above. As it stands, the EIS avoids these problems, though some attempt to resolve them should be the very heart of the alternatives section. (See p. VIII-308, last paragraph.) Rather, based on recitation of possible obstacles, such as a speculative and doubtful legal judgment about Utah's right to sell its Colorado River water allotment, the EIS avoids significant discussion of the advantages and disadvantages of that means of bringing water to alternative sites, as well as alternate means.

While water availability is recognized as a significant factor in site location, the preliminary decisions to disregard other feasible sites, such as the Southern California desert, results in virtually no consideration of other means of supplying water and coal to those sites. The FEA study recognizes the feasibility of slurry transport of coal and notes that it would take only about 6,500 acre-feet of water per year, rather than the much larger quantities of the Utah allocation proposed for this plant, but there is little evaluation of this possibility. Yet its feasibility is further demonstrated by the fact that California officials acknowledge that there are substantial quantities of water from California sources that would be more than sufficient to supply a similar plant.

Another option inadequately developed is the choice of locating a plant site near the load center, but delaying construction until non-polluting technology is developed. This question of delay or a moratorium on new plant construction is considered in the EIS but important aspects are not discussed adequately: the cumulative impacts on the environment of Kaiparowits plus any other plants existing in or proposed for the area. Despite clear indications that aspects of the current project are designed or intended to permit later substantial expansion of the size of the project, despite strong earlier commitments to such expansion, and despite the presence or development of other large plants in the region, little effort is made to deal with the impacts of these alternatives. A full discussion of alternatives would compare various combinations of plant sizes, timing, location, economic and environmental impacts, etc., to determine the least destructive and most efficient combination. In the same fashion as the comparison of plant sites individually, the methodology used to compare these different combinations must be made clear. Furthermore, in considering the impacts of various alternatives, there is an obligation to consider much more fully the compatibility of proposed alternatives with a general analysis of the most appropriate future use and development, or nondevelopment, of the entire region. Several recent court decisions emphasize the need to consider these regional perspectives and future interrelated power projects nearby. See *Greene County*, 455 F.2d 412, 424 (2nd Cir. 1972) and *Sierra Club v. Morton*, 514 F.2d 856 (D.C. Cir. 1975). The BLM 1972 Manual requires such analysis in Section 22c1.

A further alternative not considered is that of delaying the project in order to permit adequate analysis of the inflated and clearly contradictory company demand estimates. Yet, such analysis is likely to show those estimates to be overstated and to disregard both the prospect of conservation techniques and of alternative power sources. In this respect, BLM has erred seriously in justifying the entire project on the basis of demand figures which are contradictory, unsubstantiated, and wholly the company's work rather than the product of objective study and analysis. The FEA, on which BLM

wholly relies, also complains about the inadequacy of available demand figures; but both agencies nevertheless proceed to use those figures as the basis for their entire analysis of the plant and for establishing its size and urgency. This approach is clearly in violation of BLM's obligation to conduct its own study of alternatives and impacts. BLM must develop independent projections of future demand and use those projections in its evaluations, rather than self-serving material submitted by the companies. More accurate projections, coupled with a cumulative impact analysis might lead to the conclusion that no plant is required or that a smaller plant would suffice.

Whatever the demand levels really are, the EIS section on alternative means of meeting Project Objectives (VIII-350 to 355) is wholly inadequate and nearly useless. The conclusory language and the lack of explanation is fatal. For example, stating that "use of oil would permit siting of the plant nearer the market areas, but national shortages preclude use of this fuel as an alternative," (VIII-350) appears to be in unexplained conflict with the company's stated plan to utilize oil if Kaiparowits is not approved. While there undoubtedly are questions about the impacts of using either natural gas or oil, those alternatives must be elaborated to allow a realistic comparison between the proposal and the alternatives. The basis for the conclusions about oil and natural gas must be spelled out as well as the corresponding impacts of reliance on these resources.

Similarly, the prospect of meeting demand requirements by "wheeling" of power from other load centers appears to be rejected out of hand. While there may again be obstacles to that method of satisfying demand, it is at least arguable that the United States has authority to compel such coordination in order to minimize the burden on resources. Certainly there is the possibility that better coordination of peak loads may at least reduce the size of the plant needed. Yet there is no adequate discussion of the basis on which these possibilities are disregarded.

The data on geothermal energy implies that only small scale plants are feasible but makes no serious effort to discuss large scale geothermal plants such as the geysers in California with an estimated potential of 5,000 - 8,000 MW, or to consider the possibility of wet steam systems such as are used in Mexico, Iceland or elsewhere. Furthermore, the impact of one large plant like Kaiparowits versus a large number of small plants scattered over a large area is not discussed.

There clearly are different environmental as well as socio-economic impacts associated with each of these possibilities. The real question is whether some combination of alternate means of producing energy for the

service area is possible which would less seriously affect the environment than the primary proposal. Analysis of that question, if present at all in the EIS, is at best sketchy. Likewise, minimal attention is given in the appendix to wind as an energy source; but in the body of the EIS there is only brief mention at all of that alternative. There is no mention at all of the rapidly developing technology for retrieval of methane from load-center garbage dumps, hydrogen as a source of energy or oil shale development, each of which should be discussed as a possibly less destructive method of producing the "needed" power.

On the subject of oil shale, the FEA study in the Appendix (at A-135-6) suggests that development of oil shale would be a more efficient use of limited water resources; but the EIS in no way addresses that possibility in a manner that would facilitate informed decision making. The factors that should bear upon choice as between these two modes of energy production are simply not explored.

Another method of meeting project demands would be to have the companies invest in energy conservation systems. The FEA report in the Appendix at A-126 discusses this possibility, but merely reports the companies' position. The EIS lists a variety of related measures, but again offers no analysis as to their comparative costs and benefits or comparison to other alternatives.

Still other possibilities remain unexplored. It is quite conceivable, for example, that arrangements might be made with Mexico to utilize Mexican oil and waste water from Mexican irrigation projects in a plant either in Mexico or on the U.S. border, with Mexican labor. Such a project would seem to involve considerably less expense both directly and in terms of construction of transmission facilities and transmission losses. That this possibility is not beyond the appropriate scope of consideration is emphasized by another provision of NEPA which appears to have been disregarded: Section 102(E) at least suggests the need to discuss possible effects upon our relations with Mexico in light of the admitted probability of additional contamination of Colorado River waters.

While that possibility may also confront insuperable problems, the reason it is not even mentioned in the EIS is the same reason that many of the other significant alternatives are overlooked or lightly disregarded: BLM simply made little if any independent effort to investigate and define the appropriate scope of alternatives, and until too late for effective correction relied upon the applicants to present the alternatives.

Finally, in light of the proposals for land exchanges to provide the sites for the proposed facilities, specific consideration should have been given to the various exchange values of lands which may be considered for exchanges.

2. Inadequate and Improper Processes in Preparation of the EIS

The integrity of the Kaiparowits EIS was fatally undermined and its deviation from the fundamental requirements of the National Environmental Policy Act was made inevitable by the manner in which it was initiated and prepared. In particular, the lateness of preparation of the EIS, the dominating extent of company involvement, and the unrealistic deadline pressures forced on the EIS core team all assured the impropriety of the EIS process as well as the inadequacy of the final product. In addition, the EIS fails to comply with applicable instructions of the BLM Manual in several significant respects.

A. Late Preparation of the EIS

The BLM Manual 1792 requires that in determining the appropriate time to commence preparation of the statement, the Director must consider when "the earliest possible meaningful consideration of potential impact" would take place. BLM Manual 1792.12A. This requirement comports with CEQ guidelines which require that "as soon as possible . . . Federal agencies will, in consultation with other appropriate Federal, State and local agencies and the public assess in detail the potential environmental impact." 40 C.F.R. 1500.2(a).

In the Spring of 1971 the BLM Director made a determination that an EIS would be necessary for the Kaiparowits project. Yet it was not until 1974 that a core team was brought together to write an EIS, and mid-summer 1974 before the general scope of the project was defined. By this time the participating companies appear to have made final planning commitments, placing great pressure on the EIS team to produce a "justification" document. The reason for the inexcusable gap between the decision to prepare an EIS and the actual preparation is not explained in the EIS.

B. Time Pressures Defeated the Purpose of the EIS

As a result of its belated start on the project (among other reasons), the EIS core team faced heavy pressure from senior Interior Department officials, including the Secretary, to complete the draft statement and get the final statement completed as quickly as possible. Specific deadlines

were set in the face of explicit warnings that essential studies could not be completed within the time period permitted. As a result, the EIS study team was forced to rely heavily on study or analysis supplied directly by the interested companies or their consultants. To an unacceptable and improper extent it appears likely that the scope of the studies or the preliminary definitions of their objectives were heavily dominated by the companies. Although the EIS team made herculean efforts to rewrite materials or to supply independent and objective analysis, it did not have time to supply the needed studies or to reformulate the basic scope of the work. As a result, the EIS team was often unable to do more than edit the material to reflect a more balanced and less "justifying" tone, even to the point of repeatedly editing out words such as "will" and replacing them with "would." Under these circumstances, it is inevitable that substantial and balanced analysis would be lacking in almost every aspect of the EIS.

These arbitrary time pressures continue to cause improper performance of the Department's EIS obligations. Thus, it appears likely that the EIS team has been compelled to commence writing the final EIS before the last date comments were to be accepted. Yet it is unlikely that any substantial comment can be adequately answered or incorporated in the statement under these circumstances, and comprehensive review is impossible under arbitrary time limits. This is contrary to CEQ guidelines, 40 C.F.R. 1500.10(a), which provide that

where opposing professional views and responsible opinion have been overlooked in the draft statement and are brought to the agency's attention through the commenting process, the agency should review the environmental effects of the action in light of those views and should make a meaningful reference in the final statement to the existence of any responsible opposing view not adequately discussed in the draft statement, indicating the agency's response to the issues raised.

C. Applicants' Involvement To An Improper Degree

While the BLM Manual 1792 permits applicant involvement, "where appropriate," to gather environmental information, "this material may be circulated for technical comment as long as its origin is properly identified. It should not be circulated as a draft statement; however, it may be attached to a draft statement." BLM Manual 1792.21B. The Council on Environmental Quality concurs, stating that:

Where an agency relies on an applicant to submit initial environmental information, the agency should assist the applicant by outlining the types of information required. In all cases, the agency should make its own evaluation of the environmental issues and take responsibility for the scope and content of draft and final environmental statements. 40 C.F.R. 1500.7(c).

It is improper, therefore, for studies sponsored and commissioned by the applicants to be relied upon by BLM to define the scope of investigation or as the full extent of inquiry. Independent study and analysis is required of the lead agency, which must gather facts and make its own analysis. Yet it appears likely that the scope and objectives of many of the studies in the Kaiparowits EIS were defined by the applicants, who commissioned and paid for them. Such studies do not constitute the independent analysis required by law.

In particular, it is apparent that the Southern California Edison study of projected energy demand was accepted and published in the EIS as the only basis for projected energy demand. No independent study or analysis was made by BLM (as lead agency) as required by its own regulations and guidelines. See Appendix I-1, p. A-69, Federal Energy Administration Report.

Improper applicant involvement may also be found in BLM's consideration of alternatives to the plant sites. Only those sites proposed by the participants have been given significant consideration. Furthermore, the entire discussion of alternative sites and alternatives to the project is narrowly confined to the companies' immediate plans, reflecting the fact that preparation of the main dimensions of the "alternatives" chapter was largely the work of the applicants.

In conclusion, BLM has allowed participant involvement beyond the permissible limits permitted by NEPA and its implementing regulations. Such participation has limited the scope of study, inevitably producing a bias in favor of the applicants' projects which could not be overcome by cosmetic efforts. The result is a project justification document "in objective tone."

3. Inadequate Consideration of Economic and Environmental Consequences of Alternative Allocations of Water Result From Failure to Comply with Water Planning Obligations

The EIS is inadequate in that it fails to consider the Water Resources Planning Act of 1965, 42 U.S.C. §§ 1962 to 1962d-3 (1970), and the Principles and Standards promulgated thereunder. [Water Resources Council, "Water and Related Land Resources, Establishment of Principles and Standards for Planning," 38 Fed. Reg. 2477 et seq. (1973).] The EIS should analyze the responsibilities of the Department of Interior under this Act as applied to this project.

In order to meet the rapidly expanding demands for water throughout the Nation, it is hereby declared to be the policy of the Congress to encourage the conservation, development, and utilization of water and related land resources of the United States on a comprehensive and coordinated basis by the Federal Government, States, localities, and private enterprise with the cooperation of all affected Federal agencies, States, local governments, individuals, corporations, business enterprises, and others concerned. (42 U.S.C. § 1962 (1970)).

In order to implement this Congressional policy, the Act requires:

The [Water Resources] Council shall establish . . . principles, standards, and procedures . . . for the formulation and evaluation of Federal water and related land resources projects. (42 U.S.C. § 1962a-2 (1970)).

The Principles established under this Act state:

These Principles provide the basis . . . for planning of Federal and federally assisted water and land resources programs and projects and Federal licensing activities as listed in the Standards. (38 Fed. Reg. 24781 (1973)).

The Principles further provide, with respect to a "national Program For Federal And Federally Assisted Activities" that "the principles set forth in this document are concerned with alternative plans for individual projects,

States, regions or river basins." 38 Fed. Reg. 24787 (1973) (Emphasis supplied.) And in defining the "Application And Effect" of the Principles, the Water Resources Council provides that "these principles . . . shall be applied by . . . each of the Federal departments and agencies." (38 Fed. Reg. 24788.)

The Standards adopted by the Water Resources Council--

apply to Federal participation in comprehensive framework studies and assessments and regional or river basin planning of water and land resources . . . by entities performing the functions of a river basin commission, including . . . lead Federal agency with special authorization for comprehensive planning. . . . (38 Fed. Reg. 24789-24790.)

The Standards further provide:

In formulating plans to meet the objectives all alternative means shall be considered, including, but not limited to, water and land programs to be carried out directly by the Federal Government, Federal financial and technical participation in water and land programs to be carried out by State or other non-Federal entities, and Federal licensing activities that affect the development, conservation, and utilization of water and land resources. (38 Fed. Reg. 24790 (1973)).

Other provisions of the Standards which require compliance by the Department of Interior and the Bureau of Land Management, Bureau of Reclamation and National Park Service include the following:

Federal and federally assisted programs and projects. These standards apply to the planning and evaluation of the effects of the following water and land programs, projects, and activities carried out directly by the Federal Government and by State or other entities with Federal financial or technical assistance: . . .

- (b) Bureau of Reclamation projects;
- (c) Federally constructed watershed and water and land programs;
- (d) National parks and recreation areas;

- (e) Wild, scenic, recreational rivers and wilderness areas; . . .
- (38 Fed. Reg. 24790.)

The study director . . . designated by the Water Resources Council . . . and Federal members of coordinating bodies established or designated by the Council to carry out framework studies and assessments and regional or river basin planning studies are responsible for applying these standards.

The administrator of each Federal program or federally assisted program covered under this section is responsible for applying these standards to his program. Each Federal administrator shall follow these standards in establishing agency procedures for evaluation of programs and projects for conservation, development, and utilization of water and land resources. (38 Fed. Reg. 24791.)

A wide variety of the proposed Interior Department actions in connection with the Kaiparowits project require compliance with the Water Resources Planning Act and the Water Resources Council's Principles and Standards, including: granting right-of-way for pipeline and for roads; contracting for water from Lake Powell; authorizing construction of diversion works and settling ponds; permitting and supervising the extent of air pollution which will be emitted by the Kaiparowits plant and settle over Lake Powell and the numerous National Parks, Monuments, Recreation Areas, Primitive and Outstanding Natural Areas, and proposed wilderness areas in the vicinity of the Lake; approving the lease or transfer of Federal lands; and authorizing drilling for ground water or diversion of streams on federal land.

In view of these extensive functions which are significantly related to the Glen Canyon Storage Project, wholly dependent upon its waters, and which involve continuing administration of the provisions of an executory water contract for Lake Powell water, the Department of Interior should comply with its obligation under the Act and proceed to fulfill its comprehensive planning processes before approving the EIS or otherwise permitting implementation of the Kaiparowits project.

The obligation to comply with the planning processes established by the Water Resources Council is particularly crucial in Utah and the region which embraces the Upper Colorado River Basin. The Government's own studies and published documents, as well as other respected scientific authorities, demonstrate that the entire region, including Utah in particular,

is marked for extensive development of energy resources and that all of those developments are heavily water-dependent, in an arid area with only a relatively small quantity of water remaining unallocated. Thus, the White House Energy Resources Council, in its report titled "Synfuel, an Interagency Task Force," emphasizes the shortage of water as one of the key obstacles to effective development of synthetic fuels from coal and shale. Similarly, the Bureau of Reclamation Study titled "Critical Water Problems Facing the 11 Western States" explicitly emphasizes that "final decision on the use to be made of Utah's remaining uncommitted share of Colorado River water pervades almost all aspects of future resource planning for Utah." Yet it is clear from the "Principles and Standards" that not only the State authorities but also federal officials responsible for federal projects and programs have a responsibility to assure that present commitments related to water use are based upon comprehensive planning in compliance with the Principles and Standards. To the same effect, the National Academy of Sciences has recently warned that plans for coal mining and energy production in the West will demand extensive use of water and that "there is little evidence that adequate mechanisms for planning exist at any governmental level" to meet the water problems.

Despite inquiries by the Department to the State of Utah concerning its water planning efforts, no significant responses were received by the EIS group because the fact is that Utah has had no adequate planning process, planning criteria or state water plan by which to confront the competing demands for the relatively limited remaining allocation for Utah of Colorado River water. Although a petition for state rulemaking proceedings for that purpose has been filed, and though some effort may currently have been commenced to hurriedly develop a state water plan, it appears unlikely that adequate consideration of appropriate prioritizing criteria can be developed and applied in the near future. Furthermore, there does not appear to be significant effort to coordinate state water planning, if any, with the planning obligations of federal officials responsible for federal programs or projects. Yet such coordination and the development of compatible criteria for water planning decisions is required by the Water Resources Planning Act and by the obligations of the federal officials to comply with that Act and with the adopted Principles and Standards.

Finally, the failure of the Draft Statement to deal with the above problems demonstrates the wholly inadequate scope of consideration of the significant problems presented by the Kaiparowits proposal. The failure to consider the relative utility of other possible commitments of the water required for the project, and the relative impacts of those possible alternative commitments upon alternative economic development

environmental amenities, is merely one further illustration of the wholly inadequate consideration of fundamental alternatives provided by the Draft. Only regional planning and analysis can deal adequately with the key fact of life in the arid West long ago acknowledged by Major Powell: that all development, and the limits of development, must begin with a realistic prioritizing of the use of water.

4. Inconsistent and Inadequate Air Quality Analysis of the Kaiparowits EIS

The Air Quality Section of the Draft EIS is rife with unexplained and unanalyzed inconsistencies, fails to present or explore significant issues and leaves most important issues unresolved.

The basic standards controlling air quality decisions, which are applicable to the EIS, derive from the Clean Air Act and regulations promulgated under its authority by the Administrator of the EPA. Most important are the absolute limits on contaminant concentrations in the ambient air (the national primary and secondary standards), and the classes defined in the air degradation regulations published December 5, 1974, (39 Fed. Reg. 42510) which are applied to air below the maximum limits to establish "increments" of allowable degradation in relation to the "significance" of decreased air quality within the particular area. There are three such classes: Class I sets standards where any decrease in air quality would be considered significant; Class II applies to an area where moderate, well controlled growth would be considered insignificant; Class III allows rapid large scale growth with attending pollution up to the maximum limits. Each class is more precisely defined by statistical rates of degradation for particulate and sulfur oxide emissions (no other pollutants are required to be analyzed at this time). Under prevailing EPA procedures, the second worst predicted figure is that used for comparison to class increments limitations.

The important emission predictions contained in the EIS are stated at page III-28. They predict that particulate emissions will be 80% below the Class I standard annually, and only $2\mu\text{g}/\text{m}^3$, or 20% above the Class I standard for a 24 hour period. Sulfur dioxide is estimated to meet the Class I limit on an annual average, but rises to 46% of the Class II standard for a 24 hour period and 27% of the Class II standard for a 3 hour average. Projecting these figures suggests further conclusions:

(a) If 46% of the available increment for 24 hour SO_2 concentration is the highest figure encountered at 3,000 megawatts, then it may be predicted that a 6,000 mw plant should still be safely within the Class II limits currently applied to the Kaiparowits site.

(b) Given a 100% improvement in SO₂ control technology, or a halving of planned capacity to 1500 mw, the plant may be predicted to exceed the Class I standard slightly in two of the five categories of required forecasts--the 24 and 3 hour figures for SO₂ (23% and 13% respectively). According to these predictions, the plant would create no significant air degradation, or only slight degradation. Indeed, by these calculations, at full capacity the plant would produce pollution in significant amounts only in the short term SO₂ area, a variety of contaminant which is mainly invisible. Since one of the most important considerations in this area is visibility (because of the adjacent national parks, wilderness areas, and other public use lands), this has only marginal significance if these calculations and predictions are accurate.

However, in addition to the fact that these theoretical predictions do not seem to accord with experience at the Navajo and other plants, there are serious and unexplained inconsistencies in the projections which demonstrate serious failure of analysis:

(1) The preamble to the current air degradation regulations issued by EPA states that a coal burning power plant larger than 1,000 mw is considered incompatible with a Class II designation. This places the EIS predictions six times lower than those accepted by EPA. See 39 Fed. Reg. 42510, December 5, 1974. No possible explanation for this huge difference is present in the EIS.

(2) At III-30 and III-47 the EIS states that if national parks 30 to 40 miles away were reclassified Class I, emissions from the power plant would probably violate that standard. But it seems improbable that emissions would not undergo some dilution in traveling that distance, and if they were so low when emitted that they barely exceeded the Class I standard it seems doubtful that they could violate that same standard after dispersing over that distance. Thus, either dilution is not anticipated for some reason not mentioned in the EIS, or the emissions are expected to significantly higher than announced at III-28. The probable explanation is that this prediction is taken from another study, the Southwest Energy Study to be mentioned in the next item, whose much less favorable conclusions are based on different tests. At any rate, complete analysis of these inconsistencies is essential. In addition, full explanation of the impact on closer and more removed parks such as Bryce (16 miles), Canyonlands, Grand Canyon (about 60 miles each), Capitol Reef (45 miles), Marble Gorge and Glen Canyon National Recreation Area (5 miles) should be included. As will be discussed later, such analysis is imperative to fully examine environmental impact on the more important values at stake in this region, and approval should be stayed pending that correction.

(3) The probability that the plant will in fact be far dirtier than predicted by the EIS is further implicated at III-15, where the Southwest Energy Study is quoted to say that combined with the emissions from the Navajo plant, the national ambient air standards could be exceeded for SO₂ after Kaiparowits begins operation. These conclusions, based on Class III standards indicating the maximum pollution levels permitted anywhere in the United States, should be compared to the figures given for Kaiparowits alone at III-28: the same 24 hour rate that is 46% of the Class II limit is only 17.6% of the Class III limit. The Navajo plant is planned to be about one-third the size of Kaiparowits, so by the EIS figures, the Navajo plant should emit about 5.9% of the Class III limit (1/3 of 17.6%). Adding the two, we can expect about 23.5% of the limit to be approached. Yet the EIS at III-15 says that the Class III limit will likely be exceeded at times. Granted, as per EPA procedures this represents a second worst prediction, but so should the Southwest Energy Study forecast if they followed the same procedures. But it requires the conclusion that the worst prediction is over 400% greater than the second worst. Either the concentration variables fluctuate wildly at this site, or this is another example fundamental failure to explain the EIS estimates in the face of serious inconsistencies.

(4) A factor omitted in the EIS which alone requires disapproval is the fact that the published figures assume perfect efficiency of the pollution abatement equipment. In fact, no control equipment operates at perfect efficiency. Even if the equipment operates at 90% efficiency, not an unreasonable figure, the overall efficiency will be lowered to 89.5% from 99.5%. That is enough to radically change the whole picture, for at a minimum it will bring the SO₂ emissions well into the Class III area requiring a reclassification request to EPA before construction could begin. At any rate, it is obvious that until the consequences of lower efficiency is fully analyzed, and the basis for analysis set forth, we have no accurate basis for predicting this project's impact on air quality.

(5) A related major omission is the failure to consider and fully analyze the cumulative impact of the Kaiparowits plant emissions when added to those present from the Navajo plant at Page, in the same basin. Nor is the collateral problem of pollution from increased vehicular activity and other pollution generated by the massive increase of population analyzed. The cumulative effects of all these various sources could be much more serious than that of the plant itself, and so of undeniable significance to the adequacy of the Impact Statement, yet they are not seriously considered. Absent that analysis, the statement is not in compliance with its legal mandate to consider all important environmental impacts. It doesn't even give us the most elementary idea of what the real impact will likely be. Again, for each of these individual reasons alone, the EIS should be disapproved at this time.

(6) At VIII-7 the EIS rejects the alternative of constructing in California because of the air pollution situation that prevails there. This is all done in one sentence; no further comment is made. However, it doesn't require an expert to see that this is simply absurd. The proposal to construct in California contemplates somewhere along the Colorado River in the desert bordering Arizona. From Lake Havasu/Parker Dam on the north down to Yuma on the Mexican border, there are only small towns with little or no industrial activity. There is some recreational use of the Colorado River, especially at Lake Havasu/Parker Dam, and some agriculture along the river, most notably around the Imperial Dam and Yuma. Within that area it could not be possible that the national primary or secondary limits on pollutant concentrations have been reached or that the available Class II increment has been used up by other pollution sources. Not only is there nothing producing any significant pollution, but it is an area of strong continuous wind activity and very strong heat convection to aid rapid dispersion of any pollutants which might collect. It is between 100 and 400 miles from any sizeable population center and not within any important dispersion pattern for pollution from any urban source. Contrast this with the fact that Kaiparowits will share its air basin with the Navajo plant, in itself a strong pollution source, and recreational activity at the Glen Canyon Recreation Area probably equal to that at any point downstream in California, without predicted difficulty.

But more importantly, if Kaiparowits will barely create significant air degradation as predicted in the EIS, then why should there be any trouble about locating in California in the first place? This just does not make sense. If the plant is just barely out of the Class I bracket, it should be possible to locate in many places not far from Los Angeles itself. For this rejection of the California alternative to be valid, either all of California is far more polluted than previously imagined--or reported--or the Kaiparowits plant is going to be far dirtier than indicated in the EIS figures. Since the latter is the only plausible explanation, it would imply that the people at Resources Inc. are in fact aware of the much greater impact to be reasonably anticipated.

Plume opacity, and so visual obscuration in the region, is analyzed at III-37. In sum, the EIS states:

... It would be necessary for an observer to be looking directly along the plume centerline in the direction of the station, before any visibility reduction would occur. Visibility reductions in these cases were approximately 10 to 20 miles from an assumed normal visibility of 70 miles. Visibility reduction from other lines of sight was insignificant.

These estimations were made for Page, Arizona, and the Grand Canyon. The latter begins sixty miles downrange.

First of all, in respect to view points in any of the national parks endangered here, visibility reductions of as much as 30% are not insignificant (20 miles is about 28.5% of 70 miles). It must be remembered that the primary value preserved in many of these national parks is the vistas they offer from their many overlooks. Any disfiguration or degradation of these views is therefore significant.

Secondly, the statement that the plume will be all but invisible except looking right on axis to the direction of the station wholly lacks credibility. It is common knowledge that the plume from the Navajo plant, currently operating at 500 mw, is quite visible. From the air, for instance, it has been spotted from as far as 100 miles away, and followed for 120 miles without being lost before the pilot had to turn away to refuel. Since Kaiparowits will be six times as large as the present Navajo activity, it is, politely, doubtful that the plume will go unnoticed. This is reinforced by the EIS statement itself. That is, if the plume is virtually invisible, how could it cause a 30% obscuration 60 miles away in the Grand Canyon? There can be no doubt that this statement on its face is no more than feeble attempt to bypass what is possibly the most important and real problem facing the public in regard to this project.

Perhaps some of these discrepancies derive from failure by EIS analysts to consider post-emission phenomena. It may well be true that as it comes out of the stack the gases will be somewhat transparent. However, these gases undergo a number of chemical reactions in the atmosphere that can result in more opaque compounds. Smog, for example, is a post emission combination of nitrous oxides (NO_x) and hydrocarbons. The EIS tells us that large amounts of NO_x will be present; in fact, the brown discoloration alluded to in the visibility section is exclusively NO_x. The Statement, however, does not consider the possibility of substantial smog-like formations developing along the plume. Given the national park interests at stake here, this omission, like the others, is enough to require a stay of approval for the EIS.

The failure of the impact statement to examine issues raised by the admissions referred to on pages III-30 and III-47 is a crucial one. If national park and recreational lands 30 to 40 miles from the proposed site will not be eligible for a Class I designation if this action is taken, a clearly articulated national policy of nondegradation of the air in these areas will be frustrated. The effect of the plant on air quality over these public lands

is among the most significant environmental impacts the proposed action may have; the meager treatment it receives is a fatal deficiency in the Air Quality Section.

The national park interests cannot be over-emphasized. It is not an exaggeration to say that both in terms of quantity and quality, the Southern Utah/Northern Arizona area is the most important national park and recreation region in the U.S. Not only does it contain some of the most awesome and spectacular scenery available in the nation, but 20% of the total national parkland in the country is located in a 60 mile radius of the proposed Kaiparowits site. This includes, but is not limited to, Canyonlands, Arches, Capitol Reef, the Grand Canyon, and Glen Canyon National Recreation Area. Each individual area was created by a specific act of the Congress which mandated the greatest possible preservation of the designated lands--and air--for use by present and future generations. The same holds true to the large surrounding areas proposed for Wilderness designation. The proposed Escalante region only 20 miles north of the proposed area. The greatest flaw in this Statement is the cursory treatment these interests concerning the whole nation have been given. Their importance is so great that to have omitted consideration of them may well render the whole statement pointless for failure to address the important impact this activity will have on other values present in the region. At a minimum it requires careful inspection of the California site alternative because of the loss of national park interests in that area.

In promulgating regulations which establish three classification areas in the country according to the amount of air degradation which will be tolerated, the EPA director notes that "...there are some areas such as national parks where any deterioration would probably be viewed as significant." Federal Register Vol. 39 No. 235, at 42510. The Wilderness designation where almost no degradation is allowed, was established in such areas such as Bryce Ca. specifically in mind. The impact statement draft concludes that these areas may not be eligible for a Class I designation if Kaiparowits is built. And yet the basis for this conclusion and the general likelihood of air degradation in areas of recreational value are almost wholly unexamined.

The Air Quality Section is inadequate as presently drafted for purposes of evaluating the potential conflict of the federal action under consideration with national clean air policy. The seriousness of this conflict demands that the EIS be disapproved.

5. Other Environmental Impacts

A. Climate -- The EIS summarily dismisses as insignificant any effects upon climatic conditions, without addressing any reports or studies reaching that conclusion. Though localized effect is mentioned on page III-13, the nature or extent of that effect is not specified. There is no discussion of the possibility and effects of a "dust dome" upon weather and air currents. The probable extent of localized climatic effect is not analyzed, thereby raising the possibility of cumulative regional changes resulting from any overlap of this proposed plant with similar effects of nearby power plants.

B. Trace elements -- The use of trace elements listed on page III-32 is based upon the faulty assumption that 99.5% of the fly ash would be removed from the flue-gas stream. This inflated percentage cannot be realistically claimed in actual plant operation. Since the EIS admits that nine dangerous elements will be released, the studies relied upon must be carefully reevaluated in light of any change in percentage removal. The impact of mercury is critical and actual empirical studies rather than mere conjectures are needed, particularly in view of the fact that the J. B. Powell studies demonstrate that gamma-ray induced radioactivity is not removed in excess of permitted EPA limits. Finally, as mentioned on page III-32, the release of the toxic element of fluoride is "urgent" but is not discussed.

The EIS wholly fails to resolve any of the serious questions concerning the ultimate disposition of these elements, the prospect of their contamination of ground water, the effects, or their ultimate deposit in the Colorado River.

The EIS describes the radioactive dust in acre-foot runoff produced by the plant components. However, there is no overall planatic study which characterizes such as depth and direction of flow. The only source of fifty-year storms used in the calculations is an arbitrary suggestion of actual rainfall figures from the past which are used in the past as realistic in predicting future impacts.

D. Vegetation and Wildlife -- More specific data is needed on the probable extent of damage to rare and endangered species. Much information will be necessary in making a conscientious decision on these problems, because it is fully apparent that the effort to identify affected species or analyze the impacts on those species was woefully inadequate.

See letter of November 6, 1975, from Professor Delbert Wiens. The EIS merely recites species located in the general area of the proposed plant and generally declares that these species will be adversely affected to some degree.

E. Socio-economic impacts

(1) Social structure

(a) The EIS makes unsubstantiated predictions or assumptions as to the preferences of the anticipated workforce regarding living areas, housing, and overall life style. Large-scale construction and energy production typically attract employees who enjoy a highly volatile lifestyle. The EIS makes no mention of the effects of intermingling their flamboyant practices with the typically conservative political, moral, and religious attitudes of the current residents. The possibility of community polarization and confrontation of opposing lifestyles and attitudes must be considered.

(b) The opinions of current residents as to social, economic, and political issues are improperly emphasized since such opinions will be subject to massive alteration when the anticipated residents become the dominant community force. Furthermore, it is clear that the favorable local attitude toward development is based upon naive assumptions concerning the extent to which local employment will be enhanced, compared to the probable extent of in-migration of skilled and unskilled labor. The EIS does not describe the education and skills of current Southern Utah residents. There is no indication that the unemployed residents of the area are capable of filling positions in the plant or the coal mine or other secondary employment possibilities, and no data refuting the contention that a vast majority of Kaiparowits employees would come from non-Utah locations. Those residents currently unemployed could very well remain unemployed.

(c) While the EIS points out several boom-town adverse effects there is no discussion as to whether such effects can be avoided even with the greatest of effort, nor is there an adequate analysis of the capacity of Utah's political and legal structure to minimize those adverse impacts.

(d) There is no indication of who will assume the responsibility of providing critically needed services such as schools, law enforcement agencies, fire protection, and medical assistance. There is no guarantee that these much-needed services will become available at a sufficiently early date to serve the massive influx of residents.

(e) The cumulative effects of several large power plants in the same general area are not considered in the EIS. The proposed Garfield, IPP, and Warner Valley plants would require an overall increase in populace far above the 14,000 estimated. This much larger influx of employees would create additional demands upon required services and advanced planning, as well as increased community pressures. Exactly how the separate communities would interface in the area of scarce housing, municipal services, culinary water, highways, etc., must be considered in an overall socio-economic plan, and their cumulative impact upon the region.

(2) Economic development

(a) The EIS does not discuss the possibility of the project attracting non-energy producing, though highly polluting large scale industry. Should the plant prove to be economically successful, or prove to have an excess of power reserves, other concerns may locate in the same area, particularly those requiring large amounts of electricity. Such an effect could quickly urbanize and industrialize Southern Utah, with resulting cumulative adverse effects upon its unique natural, scenic and environment quality.

(b) The EIS does not adequately discuss the effect of an influx of 20,000 inhabitants upon the tourist trade. Southern Utah has traditionally been attractive to those vacationers desiring to escape an urban environment.

(c) The EIS fails to examine the employment and economic effects if a coal mine, without a power plant, were opened in Southern Utah. Such a mine could provide coal to diverse areas of the country, supplying relatively smaller power plants and resulting in less environmental pollution, while still enjoying the benefits of increased employment in Southern Utah. Increased employment does not necessarily require increased pollution.

Respectfully Submitted,

William J. Lockhart

William J. Lockhart
College of Law
University of Utah
Salt Lake City, Utah 84112
Attorney for the Escalante Wilderness
Committee, and on behalf of the

John Wesley Powell Regional Planning Coalition,
consisting of the following persons participating in
the Administrative Law Clinical Program, College of
Law, University of Utah: Bruce Plenk, George Sutton
Steve Alder, Ralph Becker, Margaret Worth, Jeanne
Henderson, G. Randall Garrou, Tim Hout, David E. Leta,
James Macpherson

THE COMMITTEE OF CONCERN FOR THE
TRADITIONAL INDIAN (CC/TI)
P.O. Box 5167
San Francisco, California 94101

November 10, 1975

Mr. Paul Howard
Utah State Director
Bureau of Land Management
125 South State Street
Salt Lake City, Utah
84111

Re: 2850 Kaiparowits (4913)

Dear Mr. Howard,

Please include this letter in the record of comments on the draft Environmental Impact Statement on the construction of a coal-fired, power generating plant on the Kaiparowits Plateau above Lake Powell in Kane County, Utah. This proposed 3,000-megawatt plant, together with the four coal mines, the limestone quarry, the 1,457 miles of new, live high voltage transmission lines, the miles of coal transport and access routes, the hundreds of acres of waste storage/disposal sites and the new town associated with the power generating project threaten enormous degradation of the natural environment along with degradation of the quality of human life in the Four Corners area. We therefore urge you to flatly deny approval of the Kaiparowits power generating project, no matter what site in the Colorado Plateau is chosen. For the same reasons, we urge you to adopt a position of disapproval on all coal-fired and nuclear power generating projects proposed on any lands held by the Federal government.

THE KAIPAROWITS PLANT AS PART OF THE
FOUR CORNERS REGIONAL DEVELOPMENT PROJECT

It is important to mention, first of all, that the Kaiparowits plant is not an individual or unique development, but part of a network of power plants and their associated coal mines which are already completed, under construction or planned in the Four Corners region. They are all part of a large plan for development of power parks and huge population centers in the Southwest as outlined by a Westinghouse report. This means that the impacts of the Kaiparowits plant--on the environment and on the quality of human life--are not isolated but compound the impacts of those several other power generating projects. In talking of water use, air and water pollution, destruction of lands and drainage systems by mining, construction of plants, transmission lines and access roads and the pollution of lands from the fallout of emissions and from waste disposal which is the storage of hundreds

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of cubic acres of poisonous materials, and so forth, one must remember this accumulation of impacts.

Over the last several years, articulate public discussion, criticism and protest against the so-called Four Corners Regional Development Project have amply pointed out the extent of environmental degradation and the harmful effects on human, plant and animal life. Also revealed have been the conflicts of interest associated with the power projects and coal mines of the Southwest. (Several reports, including the Commission on Civil Rights, 1973, indicate that governmental conflicts of interest form an intricate web among the Department of Interior, Bureau of Reclamation, Salt River Project and Bureau of Land Management which in one capacity or another are regulators of use, custodians, administrators and lessors of lands and waters while on the other hand they are recipients of electricity and co-owners and developers of the power projects. Although the Salt River Project has recently withdrawn from joint ownership in Kaiparowits, its participation in other plants continues.)

The Kaiparowits plant has been planned since at least 1964 and was originally proposed as part of that larger regional project by Western Energy Supply and Transmission Associates (WEST) in the late 1960's and early 1970's. In 1973, then Secretary of the Interior Rogers Morton rejected applications to build Kaiparowits because of its environmental impacts. Some changes have been made in the original plans, and we find that the promoters of the Kaiparowits plant are again presenting it for approval. This time, coal leases and water contracts with the Department of the Interior already exist, even before the final Environmental Impact Report is concluded. This time, too, public outcry and legal action as against the five other WEST power stations has died down, and we find that Kaiparowits to all intents and purposes is being presented as an isolated project with individual impacts in order to minimize the enormity of the undertaking. Therefore, we urge you to consider not only the Kaiparowits plant and its individual impacts, but the compounded impacts of all the WEST power generating stations--the Mojave, Navajo, Four Corners, San Juan, Huntington and Kaiparowits plants. In addition, there are the Cholla and Reid Gardner plants; a new plant planned for Arizona; one planned near Las Vegas, Nevada; two plants operating in Colorado and one in Wyoming; and five plants planned for Utah (e.g., a plant is planned for a site near Escalante, Utah, about 30 miles from the Fourmile Bench site of Kaiparowits).

WATER

In this letter we will focus primarily on the impact of the Kaiparowits plant upon water resources. Given the arid and semi-desert nature of the region, we feel water use to be a crucial issue. Other critiques have amply elaborated upon the many various impacts such as air pollution and land destruction associated with such a large, coal-fired generating plant. We support these critiques and lend our small voice to them.

Water is the West's most precious life support resource. This is especially so for the arid Southwest. As you well know, the Colorado River system is one of the most controversial water supply systems in the nation. It is over-allocated and saline. Despite the Colorado River Compact of 1922, Colorado River water is so overdrawn and polluted by

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the time it reaches Mexico that agriculture dependent upon it there has been diminished in some places by 50 percent--only one crop a year can now be supported where formerly two crops a year were common, and an international incident has been created. Arizona, the fastest growing state in the nation has been forced to seriously deplete its ground-water reservoirs in order to support a population that cannot survive on surface water supplies. Utah too has its water problems.

SURFACE WATER WITHDRAWAL

All six of the WEST consortium's power generating plants (including Kaiparowits), plus the other power plants planned for the Four Corners region, withdraw water either directly from the Colorado River itself or from its tributaries. These plants are cooled by the Dolores and Gunnison Rivers in Colorado; the Green River in Wyoming; the San Juan River in New Mexico; the Virgin River in Utah and Nevada; and the Little Colorado, Gila and Bill Williams Rivers in Arizona as well as by the Colorado River. They are all negatively affected; their impacts compound.

The Kaiparowits plant will utilize waters at Lake Powell and deplete the Colorado River directly. Water will be withdrawn for cooling and other uses and evaporated (no return to the river system). Although pollution will not be as great as when cooling waters are returned, the Colorado River will be diminished and its pollution increased in ratios of pollutants-to-water volumes.

According to the draft Environmental Impact Statement, the Kaiparowits plant will be fitted with condensation cooling towers which are "wet cooling" devices. The E.I.S. predicts that the power plant itself, at full 3,000-megawatt capacity, will use approximately 41,400 acre-feet of water each year from Utah's allocation of Colorado River water under the Colorado River Compact of 1922 and Colorado River Basin Compact of 1948. This amounts to 13,490 billion gallons of water a year; and 472.150 billion gallons of water over an expected lifetime of the plant of about 35 years.

We assume this figure given in the EIS is for cooling the plant. To our reading, the E.I.S. has not clearly explained the various uses of water by the total project nor the amounts required by each use. While at one point it is implied that 41,400 acre-feet yearly will be used for cooling, at another place the plant and mine are estimated to potentially consume 50,000 acre-feet of water annually (or 16,293 billion gallons). At yet another place, the E.I.S. estimates that, at full capacity, the plant will require a total of 29,475 gallons per minute just for make-up water to the cooling system (to replace water lost through evaporation, drift losses, and to replace concentrated dissolved solids from the cooling tower known as "blowdown"). This amounts to about 1.769 million gallons per hour; 14,148 million gallons per 8-hour period; and 70,740 million gallons for an 8-hour, five-day week. In one hundred such days, 7,074 billion gallons of water will be consumed. Clearly, the E.I.S. data is not consistent, for in 200 of such days, 14,148 billion gallons of water will have been consumed for cooling alone, a sizeable excess of the figures given in other places in the E.I.S.

In 1970, the Sierra Club estimated water consumption by a coal-fired, water-cooled generating plant to be about 20 acre-feet per year for each megawatt of installed capacity. At 3,000-megawatts, the Kaiparowits plant can thereby be predicted to consume approximately 60,000 acre-feet of water annually just for cooling. An acre-foot of water is 43,560 cubic feet and 325,850 gallons. Thus, using this method of computation, water diverted from human consumption and from agricultural uses in order to cool the plant could run to approximately 19,551,000,000 gallons of water each year.

A 1975 Sierra Club report estimates water use in the above-described type plant at 16,500 acre-feet yearly for every 1,000 megawatts of generating capacity. This could mean the consumption of 49,500 acre-feet of water annually at Kaiparowits.

Another method for estimating water use in cooling was provided by the Geological Society of America. A 1974 report in The Geologist states that, using evaporative cooling methods such as planned for Kaiparowits, a 1,000-megawatt generating station requires 12,000 to 15,000 acre-feet annually (i.e., at least 11,730 billion gallons yearly). In arid, hot climates, the water evaporates more rapidly and consumption is increased. At 3,000-megawatts, such a plant would use between 35,000 and 45,000 acre-feet of water annually for cooling.

Whichever of the above alternative methods for calculating water consumption, the Kaiparowits plant may use more water for cooling than reported in the Environmental Impact Statement. More importantly, one must consider that water withdrawn from the Colorado River for cooling is water taken away from the direct support of human life.

An alternative method of using water for cooling, the "dry-cooling tower", has been available for some years. Not one of the WEST consortium's power projects employs this method despite the arid conditions of the Southwest and its concomitant shortage of water. The Kaiparowits plant is no exception. As contained in Appendix I, page 136, of the E.I.S., the Federal Energy Administration Report of February 4, 1975 points out that "dry-cooling towers" together with use of low BTU gas at Kaiparowits would lower water usage. However, the report continues, "Neither of these technologies is considered to be economically feasible for this size installation in the time frame of interest" (my emphasis). Economic feasibility, of course, has many frames of reference. The Geological Society of America report points out that the dry-cooling tower is efficient in terms of water use. A 1,000-megawatt station requires only about 350 acre-feet of water annually for cooling with a dry-cooling tower. At 3,000-megawatts, this is an amount of 1,050 acre-feet annually, or 354,145,500 gallons of water a year. For our part, a savings of more than 11 to 19 billion gallons of water each year, compared to evaporative cooling methods, is an economic advantage which outweighs all other considerations given the water situation in the Southwest. Even so, the use of approximately 384 million gallons of water a year for cooling would still be a sizeable depletion of Colorado River waters.

In this context, one wonders at the audacity of the State of Utah and the Bureau of Reclamation, which have agreed to provide up to 102,000 acre-feet of water each year to the Kaiparowits project out of Utah's allocation of Colorado River water. As reported in the E.I.S., this topmost limit is already embodied in agreements.

Viewed nationally, the trends and impact of using water for cooling electric generating stations takes on yet another perspective. The Water Resources Council has estimated that at present water withdrawal rates, water used for cooling will exceed by 40 percent that used for agriculture in the United States by 1980.

What is the case for Utah? According to the E.I.S., the amount of Colorado River water allocated to Utah yearly is either 1.7 million acre-feet, 1.438 million acre-feet, or 1.32 million acre-feet depending upon which of three governmental reports are consulted. Hence 102,000 acre-feet a year of 1.7 million acre-feet is almost 6 percent, and 102,000 acre-feet a year of 1.32 million is more than 7 percent of Utah's yearly allotment--the proportion of Utah water that the State and Bureau of Reclamation are willing to divert from human consumption. To get a fuller picture, let's consider other proportions. 41,400 acre-feet is a little more than 3 percent of 1.32 million acre-feet, and is 2.3 percent of an allotment of 1.7 million acre-feet. These figures give a high and low proportionate picture of water use. However, the actual water withdrawal from surface water systems (the Colorado River) has not fully been discussed because water quantities used for wet scrubbing, for washing down the coal before burning and for dust abatement have not been considered. Since the E.I.S. estimates that water withdrawal for the generating station and the mine will amount to about 50,000 acre-feet annually, this is a bit more than 3 percent of an allotment of 1.32 million acre-feet.

While such percentage analyses appear to indicate insignificant water withdrawal, we must always remember that this is just one case. Five such power plants would consume approximately 15 percent of Utah's total yearly allotment. One can make still a further comparison. According to the E.I.S., all the water used by all the towns near the Kaiparowits Fourmile Bench Site amounted to only 178 acre-feet in the year 1974. The contrast is noteworthy.

Let us include together other power plant projects to get a fuller picture of water use in the Southwest. Based upon various estimates, the five other generating plants of the NEST power grid taken together will deplete the Colorado River and its tributaries by about 177,200 acre-feet of water each year at their full capacities. The Navajo plant already in 1974 used 2,000 acre-feet a month, and will use 34,000 acre-feet of water a year at full capacity and is just down river from Kaiparowits. Add to the 177,200 acre-feet annually, the Kaiparowits' withdrawal of 50,000 acre-feet of Colorado River water. Then add to this withdrawal

the accumulated withdrawal by the 12 other power plants operating or planned which were discussed above. One gets a clear picture of uncoordinated and irresponsible water-use planning for the Colorado River drainage system which is the primary support of human habitation in the Southwest. For example, just 50,000 acre-feet or 16.293 billion gallons of water a year can support a city of one million people at an average rate of 44 gallons per capita per day.

Water-use planning is even faulty among utilities and power developers. According to an article in *Environment* magazine, a recent, unpublished report by the Bureau of Land Management suggests that there is not enough water for energy-development projects in the Rocky Mountain Plateau region, an area dependent upon the Colorado River drainage system. Electrical generating plants, coal gasification facilities and oil shale projects in operation or being planned will eventually require 1,031,880 acre-feet of water yearly, and available water resources will fall short of this demand by at least 200,000 acre-feet per year (or 159,780 acre-feet annually more than can be made available according to existing water withdrawal regulations such as the Colorado River Compact). While the report indicates cavalier planning in disregard of a limited resource, it also failed apparently to account for a number of associated water uses such as cooling for electrical power plants, supplies of drinking water for expanding population centers and irrigating the strip-mined lands that must be reclaimed. Thus, the report underestimates the potential over-appropriation of water by these energy-development projects.

GROUND WATER

Rainfall in the Southwest is sparse except at high altitudes. The surface drainage systems such as the Colorado River and tributaries concentrate this scant rainfall and have provided the water support for human and other life forms over thousands of years. Ground water in the Southwest is not a viable alternative in that it is nearly non-rechargeable. Rainfall is too scant to adequately recharge the ground-water reservoir systems. Withdrawal from a non-recharging reservoir of ground water is called "mining" the ground water; it is a depletion operation. In some places, such as at the Peabody mine on Black Mesa, the ground-water recharge rate is so low as to be effectively nil. Taking Arizona as a whole, the situation is similar. The fast growing population and economic expansion not only depend upon the surface systems, but because the surface systems are inadequate, have required the withdrawal of ground water. The U.S. Bureau of Reclamation in 1969 estimated that about two-thirds of all water used in Arizona was pumped from natural ground-water reservoirs at a rate which exceeded natural recharge by 2.5 million acre-feet per year. The mining of ground water, as exemplified in Arizona, results in declining ground-water levels and deterioration of ground-water quality which has forced and will continue to force thousands of acres of fertile lands out of crop production. It is a continuing process of desert making. Clearly, ground-water resources in the Southwest are not a viable alternative water source; and Utah should learn a warning from Arizona's present policy of water brinksmanship.

Already the incipient cycle of ground-water use and depletion is evident in Utah. Glen Canyon City relies on wells for domestic water. The new town associated with Kaiparowits is projected as requiring 5,900 acre-feet of water a year, pumped from deep wells according to the E.I.S. This water will support a population of 15,324 persons according to the planners (minimized by the Bureau of Land Management projection of 9,300 persons). The situation of other towns and cities in Utah should be investigated in this regard, for when the surface waters are diverted to power generating uses, the people will have to seek water somewhere. The quarry will also need water for various uses and will withdraw 2 acre-feet a year.

Again, as in our discussion of surface water, one must not consider the Kaiparowits impact upon ground water in isolation. The aquifers which support towns in Utah may be continuous with those in Arizona; the aquifers in the north of Utah may be continuous with those in the south, site of the instant project. Hence, much greater study must be done to clarify the total ground-water depletion picture (including the plans for other generating stations in Utah). The draft E.I.S. is sadly lacking in this feature.

While the U.S. Bureau of Reclamation invents bizarre and desperate schemes to increase water flow in the Colorado drainage (1969 schemes included poisoning plants along the river shores, spraying the river and its lakes with anti-evaporation chemicals, and logging of acres of watersheds to increase run-off), the Department of the Interior and the States of the Southwest have promoted waste of this precious resource both surface and subsurface. Monetary considerations associated with the electricity generating industry seem to override all other considerations no matter how urgent and important. Thus the coal leases and the water contracts with the Department of Interior already exist as between the developers of the Kaiparowits plant, the State of Utah and the Bureau of Reclamation.

WATER POLLUTION

The water withdrawn for use at the Kaiparowits generating plant and associated facilities will not be returned to the Colorado River. For example, blowdown water from the cooling towers (estimated in the E.I.S. as amounting to 1,735 gallons per minute) will be piped along with sewage treatment plant effluent and water from coal washing to several evaporation ponds where the water will evaporate and the dissolved pollutants will be deposited. If such evaporation ponds are adequately constructed, no flooding will occur whereby these highly polluted waters will be released into the surface drainage systems. Proper construction of the evaporation ponds is crucial for the entire Southwest is known for its sudden floods (all the streams on the Kaiparowits Plateau are subject to periods of intense flooding as noted in the E.I.S.). It appears to us that the draft EIS treats this point superficially—merely reciting the plans of the Kaiparowits designers and nowhere commenting on the adequacy of these designs. At the very least, the E.I.S. should report on the success of evaporation ponds at other power generating facilities where periodic flooding has possibly been experienced. The enormity of this pollution threat cannot be stressed enough, given the existing condition of the Colorado River, and given the potential for ruining acres of land by rendering the soils unfit for vegetation.

Similarly, the mitigations against pollution of surface water drainage systems by the leaching of pollutants and run-off from the mine, the limestone quarry and the ash and sulfur dioxide disposal storage areas are questionable. At page 44 the E.I.S. describes that all run-off from the storage sites will be caught and channeled so as not to pollute surface drainage systems. These catching and channeling devices are treated superficially and inadequately by the E.I.S., again there is mere repetition of the designs and plans but no analysis or critique of their efficiency. In light of the tendency for periodic intense flooding in the region, pollution of surface drainage systems seems inevitable. Degradation of the water systems and poisoning of the land by pollutants (such as slag, sulfuric acid, and so forth) are long-lasting and serious threats. A serious matter in an already arid environment where plant, animal and human beings are already hard-pressed to survive.

Construction guarantees can only be ascertained by competent engineers. The threat to the Colorado River drainage system and to the lands surrounding the project warrant such further guarantees of safe disposal.

Meanwhile, another question is raised by the evaporation pond method of waste disposal: the threat to the ground-water system by the leaching and seeping of pollutants. Not only is the ground-water quality threatened at the limestone quarry, where depth to ground-water is only 50 feet, but also by the coal mines, the 60 million cubic yard ash and sulfur dioxide sludge storage area north of the plant as well as by the plant waste evaporation ponds themselves. The E.I.S. is completely inadequate on these points. First, there is not an adequate study indicating the amount of leaching and seepage expected from the storage areas, evaporation ponds and so forth. Second, while monitoring systems are planned which will detect leakage or seepage from the evaporation ponds into the surface and ground-water systems, these monitors will take about one month to detect a large leak and up to a year to detect a small leak; no such monitors are planned around or in the ash and sludge disposal areas. And, third, absolutely no recourse, no required remedy and no punishments are available by which to insure the protection of the ground and surface water systems. No means is provided for insuring the repair of such leaks and seepage.

With respect to the evaporation ponds, the E.I.S. reports that to prevent degradation of ground water, the several ponds covering about 180 acres will be lined with a 2-foot layer of madstone with a permeability coefficient of .05 feet per year. The report fails to state what this means in actual gallons of seepage and thus is extremely inadequate on this point. Again, the EIS merely reports on what the plans are and blithely ignores any analysis of these plans. Thus, actual seepage into the ground-water reservoirs over an area of 180 acres could amount to a great deal of water. Since lime-sulfur dioxide will be a major component of the pollutants in these ponds, and since sulfur dioxide turns to sulfuric acid easily in contact with water, the threat to the ground-water table is serious.

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Pollution of Lake Powell and the Colorado River will also occur if the Kaiparowits plant is approved. Withdrawing volumes of water concentrates the pollution in the remaining water in the river. In addition, there is a major inconsistency in the E.I.S.: if none of the water used for cooling is to be returned to the river and lake, how is it explained that the concentrated salts from the cooling towers are returned to the river? Such salt deposition, amounting to 5,800 tons per year (according to the Sierra Club) will affect more than 930 acres of vegetation and soils according to the E.I.S. Salt deposition one mile away from the plant will amount to 165 pounds per acre per year, again according to the 1975 Sierra Club report. Because of the significant impact of this process, some mitigations should at least be required. Furthermore, the E.I.S. should explain or clarify this inconsistency in the final version.

In addition, of course, the various harmful pollutants resulting from the coal-burning process (the particulates, the nitrogen oxides, the sulfur dioxides, the mercury, radioactive trace elements and lead) will blanket the earth and waterways for miles around the plant. All of the above mentioned pollution dangers to an already over-allocated and saline water system should not be condoned for one minute.

THE KAIPAROWITS PLANT CONFLICTS WITH OTHER WATER NEEDS

Arizona is already one of the fastest growing and most water-deficient states in the nation. The Kaiparowits will withdraw waters already desperately needed in Arizona.

The depleted Colorado River already is the focus of international scandal with respect to the United States treaty commitments to Mexico.

Thus the waters allocated to power plant projects is in direct disregard and in conflict with the needs of already established communities. We have discussed the hopelessly self-defeating depletion cycle accompanying dependency upon ground-water supplies for sustaining populations.

Ironically, further depletion of Colorado River waters is in conflict with projects such as the Central Arizona Project, the Salt River Project and the Central Utah Project--all planned to develop and transmit Colorado River waters (including tributaries) to various population and farming centers in the respective states.

We do not endorse or support these programs, but mention them here merely to point out the lack of coherent, integrated planning which typifies so-called "environmental planning" by government agencies and the agencies of the Department of the Interior. This is nowhere more apparent than in governmental endorsement of power generating projects in complete disregard of ultimate environmental/ecological consequences.

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Lack of coherent environmental planning can be seen with respect to the Central Arizona Project and the Salt River Project. For example, the Central Arizona Project is endorsed and supported by the Bureau of Reclamation and the Bureau of Land Management. Both the Salt River Project and the Bureau of Reclamation are large co-owners in the Navajo generating station. A sizeable percentage of the power received by the Bureau of Reclamation from the Navajo plant will go to the Central Arizona Project. Thus these participants in the WEST power consortium (the Salt River Project, for example, is the primary recipient of Navajo plant electricity and participates in several of the other WEST generating stations), are responsible for planning water use in electrical generating facilities. They are also responsible for managing the already dwindling water supplies of Arizona. On the one hand they are literally giving precious water away to the power companies and promote the pollution of the Colorado drainage system; and on the other hand they justify their participation in the power projects by asserting that they need the energy to pump and pipe Colorado River waters all over the state. They diminish the very water supplies under their jurisdiction. A vicious cycle.

Closer to the point is the Central Utah Project, handled by the Bureau of Reclamation under the U.S. Department of Interior. The U.S. Department of Interior news release of August 21, 1975 states that the Central Utah Project, utilizing the Strawberry Aqueduct and Vat Tunnel, "... will develop most of Utah's share of Colorado River water for municipal and industrial purposes along the heavily populated Wasatch Front area of the state, plus providing water for irrigation, recreation, hydroelectric power and fish and wildlife" (emphasis ours). Such waters will be taken to Salt Lake City, to Utah and Utah Counties and to the central portion of the state. A portion of the water is also intended for the Ute tribe on various reservations in Utah.

Is not the Central Utah Project in competition with the Kaiparowits (and other generating stations planned) for use of the precious Colorado River waters? Will established communities in Utah have a sufficiency?

INDIAN WATER RIGHTS

The involvement of the Ute tribe in the Central Utah Project brings up one further facet of water mismanagement: Indian water rights. In *Winters v. U.S.* (1908), the United States Supreme Court clearly established Indian rights to water. Enunciating the Winters Doctrine, the Court ruled that the treaties creating Indian reservations implicitly reserved enough water to sustain civilization on those reservations. Aboriginal or ancestral Indian claims to waters and lands gave the tribes proprietary water rights; where no aboriginal claims were made, the reserved water rights were created from property interests. Thus, Indian water rights claims are paramount and supercede any and all other claims upon water resources.

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With or without the Central Utah Project, the Ute Indians and other tribes of Utah have first claim upon the river waters of the Colorado and its tributaries, and upon ground waters.

The Utes in Utah, the Navajo and Hopi in Arizona, and the various other tribes in these two states and in California, Colorado, New Mexico, Wyoming and Nevada have proprietary, paramount claims upon the waters in the Colorado River and its tributaries according to the Winters Doctrine. They have primary claims also to the ground waters in these states.

The abuse of Indian water rights is the subject of the 1973 U.S. Commission on Civil Rights report; and implicates the energy-development projects of the Southwest.

Withdrawal of Colorado River waters for one instance, may be in conflict with the Navajo Irrigation Project which was authorized by Congress in 1962, and which over these thirteen years has not progressed because of water allocation problems. Whether or not the Project is well-conceived or not, the real issue is the right of Indian reservations to their guaranteed water rights as against the allocation of these waters to power-generating facilities. The Kaiparowits plant participates in this problem, and such participation should be included in the E.I.S.

If Colorado River waters are diminished or further polluted, the tribes will be deprived of their guaranteed water supply; the Winters Doctrine and the rules of the Supreme Court will have been violated and the survival of the people threatened.

SOCIAL IMPACTS

The social impacts of diminishing the flow of the Colorado River system with respect to Indian water rights has been briefly discussed above. Depriving the tribes of sufficient water supply is tantamount to racism and genocide--at the very least it is ethnocide, for changes in tribal cultures cannot help but develop if people are forced off their ancestral homelands. Social change must develop where a people are victimized by corporate interests: alienation is only one of such social impacts. Unless tribes assert their rights to water, they will be placed in the same position as the Navajo who assigned their rights to a significant quantity of Colorado River water to the owners of the Navajo plant. Reduction of economic self-sufficiency can only follow loss of water.

Power plant projects such as Kaiparowits also impact on Native American religious life. Since most tribes have a religion closely integrated with the care and respect for their lands, and for the whole earth, every project such as Kaiparowits violates that religious tie. Every project is a desecration. The burning of St. Peter's in Rome could not affect Catholics more than the Peabody mines and the Navajo and Mojave plant affect the Hopi.

In a general scope, diverting of precious waters from the Colorado Drainage system deprives already established communities of this precious resource. The negative impact could destroy as many jobs as are created by the plant and associated commercial ventures. For instance, should water quantity and quality be further degraded, farming in the Southwest

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could follow that of northern Mexico--that is, be reduced by one-half or even more. In addition, the already established communities of the Southwest may be forced to create population growth limits in order that waters be diverted to the use of power plants, power plant worker communities and the even larger population centers planned as outgrowths of the power generating network as envisioned by Westinghouse. Both the already established communities of the Southwest and the new population centers--being water deficient--will have to rely upon importation of water for continued survival. If and when farming capacity declines, they will also have to import foodstuffs as well. This creates a higher cost of living. Further, there will be forced dependency upon various means of transport, which in turn means the increased use of gasoline and other energy sources associated with building and fueling these transport systems. Large population densities in areas lacking sufficient water and food supplies place immeasurable burdens on the environment and upon the whole social-economic system of the nation. They create the necessity for ever expanding and ever more costly networks of life support systems.

The effects upon health have already been adequately discussed by others. The increase of plant, animal and human illness is impossible to measure exactly, but the causes and effects are well known. The populations of the Southwest are being exposed needlessly to additional health problems which cost individuals and the society enormous amounts of money as well as pain and suffering. Reduction of plant and animal life affect the environment and the food resources upon which human populations depend.

Indian populations will likewise suffer health, food and water problems. Additionally, as also pointed out in the draft E.I.S., the creation of large non-Indian population centers and the construction of energy-related developments on or near the reservations have social and emotional impacts upon Native American populations. History has shown that such developments foster economic and other pressures which are expressed in racism and in the robbing from Native Americans their waters and their lands. These are not empty phrases--the Indian Claims Commission, the U.S. Court of Claims and the Commission on Civil Rights 1973 & 1979 document such an assertion. The several tribes of the Southwest, and the Hopi and Navajo in particular, are suffering such social and economic impacts at this very moment.

Furthermore, the integration and self-sufficiency of Indian cultures will be undermined from without by the various pressures created by increasing non-Indian encroachment upon their lands and water resources and from the influences of population centers nearby, while from within their very lifeblood will be drained in the form of water diverted to power plant uses. If farming is the main sustenance of the tribe, that tribes self-sufficiency will be irreversibly destroyed and chain reaction changes will come about. Some Indian spokespeople even predict the loss of all water rights, for example, if such power-related development continues at its present rate unless tribes assert vigorously and ceaselessly their claims.

The power plant complex grid, including Kaiparowits, will also deprive the general public of restful and non-polluted national parks and forests where more than 3 million people yearly seek to rejuvenate themselves and make contact with nature. The Kaiparowits project would most grossly add to the violation of the many national park and forest systems in the area through the various pollution types discussed previously here and in other criticism.

Furthermore, the Kaiparowits plant and supporting developments will all be situated on public lands held in trust and managed for the people of this nation by the Bureau of Land Management. We protest the construction of the Kaiparowits on this ground also: that the project constitutes mismanagement, depletion and irreversible destruction of thousands of acres of public lands if it is allowed to be built. The power plant, the quarry for limestone, the four coal mines, the new town, the waste storage sites, and many access and transmission routes will be located on such public lands. The public water and air will be abused through consumption and pollution. Federal lands are lands administered, protected, managed, bought and paid for by the Federal government as an agent of the people. The nation's waters are similarly public waters. Such lands and waters are, in effect, held in trust for the people of the United States for our mutual, long-term benefit and survival. Violation of this trust responsibility occurs when the governmental agencies waste these precious trust resources solely for the benefit and profit of a few--of the coal and utility companies. Our heritage and our future are at stake. Our environment, our historical and archeological resources and so forth are non-renewable and finite in the very ultimate sense.

ECONOMIC IMPACT

In addition to the economic impacts discussed above, certain arguments may be made that the total economic impact will be negative.

As to the State and Federal revenues expected to arise from the operation of the Kaiparowits project, it is possible to postulate that these revenues will be completely offset by costs.

The draft E.I.S. estimates there will be 5,235 construction jobs and employment for 3,135 persons at the plant at full operation. An A.P. article of October 5, 1975 reports that some 3,000 jobs will result directly from the project, with 5,800 more jobs in associated commerce. That such limited employment possibilities should be favored over the established lives and livelihood of all peoples in the Southwest, or over the more than 3 million visitors yearly to the area (and jobs associated with such tourism) appears to be a grossly skewed viewpoint. A decline in farming capacity resulting from water pollution and diminishment would more than offset such employment possibilities.

As to State income, the same article reports projected additional property tax revenues of \$28.9 million a year, and sees a payroll increase of \$108.4 million in Kane County by 1986 (we assume this latter is an accumulated

rather than a yearly figure). However, the Sierra Club, August/September 1975, points out that the State of Utah has already made tax concessions which will tend to offset income. The energy bill package passed in 1975 by the Utah legislature requires the power companies to only prepay specified taxes which would be used to construct various support facilities prior to construction of power plants. The utility companies could then write off these tax payments at a later date when the power plants were completed and generating electricity and income. The power companies thereby do not foot the costs of developing plants and mines. And the real income is diminished by these offsets.

The E.I.S. predicts that all together, the taxes and royalties by industry, employment and the new town are expected to reach \$65 million a year. As has been discussed, the State will receive little after offsets and deductions are taken. Tax revenues to the Federal government will be nil since utility companies have been exposed recently in the news as paying little or not taxes each year despite millions of dollars profits.

On the other hand, however, will be the costs to Federal, State and local government associated with population centers: providing schools, public transportation, utility connections and utility districts, sewage systems, water service, police, fire and court systems, hospitals and the other services and materials as required by any population center.

The new town alone (at either 15,324 or 9,300 persons) will be more than three times the existing population of Kane and Garfield Counties combined (i.e., 3,229 persons). The draft E.I.S. states: "If adequate housing and services are provided as proposed, very significant social impacts may be avoided" (emphasis added). Drawing a parallel with other areas where power plant development has fostered such population booms would be appropriate to an adequate E.I.S. Based on data provided by the Sierra Club (there is a lack of such relevant data in the E.I.S.), one sees a startling trend. Kane County can expect a situation like Rock Springs, Wyoming, site of the Jim Bridger plant. The Sierra Club data indicates that as the population doubled at Rock Springs: caseloads at the mental health facility have increased ten-fold in five years; emergency room admissions increased 333 percent; police calls have increased from 8,800 in 1970 to 36,000 calls in 1974; and major violent crime has skyrocketed. Local businessmen find they must compete with the wage scales offered by the new industries. These are negative socio-economic impacts. They have a price in human suffering; they also have a price tag.

In addition to all of the above, none of the power generated at Kaiparowits is intended for use in Utah. Therefore, power supplies to any new communities as well as to the rest of the state must be bought and paid for and derive from some other power-generating source.

To our reading, the E.I.S. is not only one-sided in support of the Kaiparowits project, with respect to economic and environmental data, but is rendered unacceptable in its failure to detail in dollars and cents and individual lives the socio-economic costs of the Kaiparowits project, only a few of which have been suggested here.

ALTERNATIVES

First of all, the so-called "energy crisis" must be seen as a fabrication, created by wanton waste and high-pressure sales of electricity consuming mechanisms. The rationale for building the Kaiparowits plant is given by the E.I.S. as, first, demand for power is increasing, and second, that electricity consumption in the Kaiparowits market area is expected to double in the ten-year period 1974 to 1984. This is not a new rationale; such doubling is the trend perceived by many authorities. However, the demand for electricity does not indicate a need for it; and the trend is not new.

The United States Geological Survey and the National Water Commission have published figures which indicate that while the population in the United States has increased by 10 percent between 1960 and 1969, energy production and consumption doubled. They report that at present development rates--independent of population growth--electrical energy generating capacity and production has continued and will continue to double exponentially every 10 years. They also observe that such exponential growth cannot continue indefinitely. Conservation is therefore unavoidable. If unavoidable, why not start right now? Before our resources and environment are completely desecrated and uninhabitable.

The United States, with less than 6 percent of the world's population, uses between 30 and 50 percent of all the energy produced in the world. With such figures, it is easy to see how (not why) utility companies can say that demand is increasing.

The University of California Energy and Resources Program (as reported in a UPI article of September 20, 1975) has released a further opinion that not only is such rapid growth in energy production in the United States unnecessary, it is also less efficient and more costly than conserving energy. Reducing waste in industry, transport, homes and offices makes more energy available at smaller economic cost than the alternatives of increased mining, drilling and power plants. Paul Erlich has estimated that energy consumption in the United States can be reduced by 30 percent without a change in life style and without the need for any new or additional power plants.

Even the E.I.S. states that a "slowdown on energy development would help maintain natural environment and wild life."

In addition to conservation, there are several non-polluting, non-destructive sources of energy which have been ignored because of the ease and vested interests of continuing to exploit fossil fuels. Solar energy is sadly lacking in research funding. The use of continuous, non-depletable resources (such as solar energy) have immense relevance to continuance of human life. Wind motion and wave power offer significant alternatives also. Lastly, waste disposal power plants (using pyrolysis) are a known alternative. These plants produce power, take care of waste disposal problems (which are considerable), and provide employment. The methane, carbon monoxide, oxygen and hydrogen produced in processing are

fuel gases which power the plant. Carbon dioxide by-product if released into the atmosphere is a natural atmospheric element which plants can recycle. The cost of such plants runs to millions of dollars, not billions. By-products such as ammonia and methanol can be sold as they are a basic chemical required by many industries. These suggested alternatives come to mind, there are others of course. Primary is conservation, a law of nature too long ignored by industrially centered societies.

CONCLUSION

In consideration of the factors presented here, the Kaiparowits plant project is not only unnecessary but represents a potential and significant degradation of the environment, natural resources, and the quality of human life in the region.

With respect to the issue of water use, the E.I.S. makes an analysis which should be heeded. According to the E.I.S., growth of the Southwest is creating increasing demands for water. That even without the Kaiparowits project, certain trends are suggested:

1. Use of ground water in excess of recharge rates, especially in agricultural areas, will result in further subsidence of productive lands;
 2. As ground water supplies dwindle, increased pressure upon perennial streams such as the Colorado River and its tributaries will ensue, resulting in the possible necessity of importing water and the use of artificial channels;
 3. Water quality in perennial streams will decline as upstream use increases;
 4. Unless perennial streams are diverted to agricultural needs, productive farm land will have to be retired as ground-water supplies dwindle; and
 5. Environmental impacts will include damage to flora and fauna.
- (See pages 416-417, Chapter II.) All of these trends degrade human life too.

With all these facts in mind, we urge you to reject at once and finally the application to construct a power generating station on the Kaiparowits Plateau.

Sincerely,

Carol Grenall

Carol Grenall

For: The Committee of Concern for the Traditional Indian

cc: Mr. Thomas Kleppe
Secretary of the Interior
Department of the Interior
Washington, D.C. 20240

Mr. Calvin L. Rampton
Governor of the State of Utah
State Capitol
Salt Lake City, Utah 84114

Mr. Gerald Ford
President of the United States
The White House
1600 Pennsylvania Avenue, N.W.
Washington, D.C. 20500

Mr. John McComb
Southwest Representative, Sierra Club
2014 E. Broadway, Room 212
Tucson, Arizona 85719



Sierra Club

Southern California Regional Conservation Committee
Desert Sub-committee

November 15, 1975

Bureau of Land Management
Utah State Office
P. O. Box 11505
Salt Lake City, Utah 84111

Re: Draft Environmental Impact Statement on Kaiparowits
Power Project.

The Desert Sub-committee of the Southern California regional Conservation Committee of the Sierra Club would like the following comments on the draft environmental impact statement for the proposed Kaiparowits power plant be entered into the hearing record. The following is our comments on the proposed transmission lines.

Sheep Hole Pass:

The Sheep Hole Pass alternate route would go through Little Morongo Canyon which has permanent water which is used by numerous species of wildlife including the desert bighorn sheep, while no inventory of wildlife has been made in Little Morongo Canyon, in Morongo Canyon, 2 miles to the west, has recorded more than 400 species of birds. This is an extremely unique area and attracts visitors from all over the United States. There is an extremely valuable fossil area about 5 miles east of Paris. The access road would open this area to increased collecting pressure. This alternate would cross the proposed desert hiking trail north of the Old Man Mountains and would destroy the desert solitude of the hiking trail. There is a spring just north of Arrowhead Junction which numerous wildlife depend on particularly in the summer. The road boundaries have some archaeological sites. More and easier vehicular access to the area will result in accelerated destruction of the archaeological resources. The entire line constitutes a new alignment which will create more access to undisturbed desert lands. The section of this route (as well as the Bristol Mountains route) through Little Morongo Canyon alone should disqualify both routes from being considered as viable alternatives.

Bristol Mountains:

The values in Little Morongo Canyon were described in the Sheephole Pass alternate. The north-south segment constitutes a new transmission corridor which will create more trespass problems for the Twentynine Palms Marine

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Base. The line would pass over and near the Chinese railroad camps in the Pisgah area. These camps qualify as national historic sites and should be so designated. The Bristol Mountains have desert bighorn sheep and prairie falcons as significant, recorded wildlife. The Kelso Dunes have been designated as an area closed to vehicular use. This was done to protect the rare plants and animals found only in this dune system. The total habitat extends from the top of the dunes through the wash between the dunes and the Granite Mountains up to the top of Granite Mountain (6786 ft.). This area has been the site of many research projects. This line also crosses the spring north of Arrowhead Junction (see Sheephole Pass route comments).

Ward Valley East:

This represents a new corridor parallel to an existing one. In addition to the problems delineated in the preferred route comments after they join near Desert Center, this route will cut in half the Sacramento Mountains which has the highest concentration of Cholla cactus in California. This area has been proposed as a natural area by BLM. The University of California would like this area as a desert teaching reserve. For this reason alone, CCR should not allow this route to be called a viable alternate route.

Martinez Canyon:

This alignment would be a new corridor some first through agricultural lands, disrupting the cultural practices. The proposed transmission line goes within 3 miles of Lake Skinner County Park. This lake and its surrounding hill is one of the few regions in southern California that has bald eagles. The upper reaches of Lawson Canyon are slated for future expansion of the county park. The line goes through Arrowhead Junction state park in the vicinity of Coyote, Horse and Tule Canyons. This area was just recently acquired by the State Parks Commission. These canyons have permanent water and support a variety of wildlife including desert bighorn sheep. In fact, Coyote Canyon was closed to all human use last summer to permit the sheep to have access to water and range extension. This area also contains unrecorded Indian sites. The line would go through Indian lands and the Rockhouse Canyon Indian sites. Martinez Canyon was just acquired by Fish and Game as prime desert bighorn sheep habitat and is presently supporting the largest herd of sheep in California. There are numerous Indian sites in Martinez Canyon including the fish traps at the mouth of the canyon. This portion is extremely high in resource values as well as a prime scenic area with wilderness potential. The line goes over the Kelso Dunes which has an abundance of desert shrub resources. As the diversity of California, a power line through this reserve would destroy its very raison d'être. The line then continues along the historic Bradshaw trail which someday should be designated as a linear national historic site. It also crosses Twentynine Palms, an important wildlife watering site. Although this is called a new alternate route, the destruction of resources is so great that CCR should delete this entire route from the proposed alternate routes.

North Indio Hills:

This alignment would remove the power lines from the mouth of the Riverside County Palm Oasis Parks and put them north of the parks except for Bushwalla Palms. Here the alignment was deliberately turned west at a point so that it runs next to Bushwalla Palms instead of away from the park. This alignment must have been chosen to make the preferred route more acceptable. The palm oases were established as wilderness parks to protect the water related biological values. This alignment should be deleted as one of the alternate routes.

In summary, BLM has not proposed any reasonable and viable alternate routes. In short, it appears that BLM has routed all the proposed alternate routes through such environmentally sensitive areas so as to make it appear by comparison that the preferred route is most desirable and acceptable. For this reason alone, the draft EIS should be rejected as inadequate and referred back to BLM for completion in compliance with NEPA.

Preferred route:

The preferred route is more environmentally acceptable only and only when compared with the proposed alternate routes. For instance, the preferred route goes through the largest archaeological site in Riverside County in the Lakeview Mountains. This site contains pictographs, bedrock mortars and three hidden sites. This route would cross A-62 and R-243, both designated as scenic highways by Riverside County. Power lines along or across these scenic highways is inconsistent with their present designation. This is a particularly scenic area of intergradation of chaparral and sage communities with an oak-conifer community at the higher levels. The towers and lines would be very visible and seriously detract from the scenic values. The San Geronimo Pass area presents a special problem. The combination of private property in an urban development, the only general aviation airport for 20 miles, and the Morongo Indian Reservation makes placement of a transmission line very difficult. These problems have forced the alignment up into the equally unacceptable wild and scenic areas. The alignment south of the Indio Hills would destroy the scenic entrances to the Riverside County Palm Oasis Parks. These palm oases are located along the San Andreas fault and one wonders what fate of the power line would be from a large earthquake centered one mile away. A power line within 0.5 mile of the entrance to Joshua Tree National Monument would be very distracting. There are a number of petroglyphs in and near the proposed alignment near Hayfield Lake which would be destroyed or severely impacted. One of Patton's World War II headquarters would be near the alignment and new or improved access roads would open this area to further destruction. This is clearly not the best alignment.

Lyle K. Gaston, Lyle K. Gaston, Chairman

ARIZONA DESERT BIGHORN SHEEP SOCIETY INC.

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P. O. Box 5241 - Phoenix, Arizona 85010

Nov. 13, 1975

Mr. Paul L. Howard, State Director
Utah State Office
Bureau of Land Management
P.O. Box 11505
Salt Lake City, Utah 84147

Dear Mr. Howard

After careful study of the Kaiparowits Draft Environmental Impact Statement the Arizona Desert Bighorn Sheep Society has the following recommendations and comments.

Transmission lines thru the Arizona Strip or Grand Canyon impacting on present bighorn sheep habitat or habitat that can support potential bighorn sheep restoration programs will be opposed by this organization. We are especially concerned over any proposed lines thru the Virgin Mountains, Beaverdam Mountains, Black Mountains and the Grand Canyon.

In view of the fact the Mohave generating station coal slurry line has sufficient access road and cleared right of way to support a twin 500 KV transmission line for almost its entire length, this organization can see no purpose or reason to construct new roads and clear a new right of way for the Kaiparowits-Moenkopi-Mohave transmission line.

With the requirement for a 2000 foot separation between transmission lines, to parallel now existing lines means there would be two lines one-half mile apart with double access roads and double cleared right of way.

This proposed transmission line, which will pass through the Black Mountains would impact bighorn sheep and their habitat. Following the existing coal slurry line would keep this impact at a minimum.

This project as proposed has enormous environmental ramifications and the Arizona Desert Bighorn Sheep Society cannot support the Kaiparowits project as it is now proposed.

Sincerely yours
Harley Young Jr.
Harley Young Jr.
Legislative Chairman

For Ned Smith
President

CC: Arizona Game and Fish Dept
Arizona State Clearinghouse
Arizona Wildlife Federation
Southern California Edison
Arizona Public Service Co.

599-XI

LEAGUE OF WOMEN VOTERS OF ARIZONA

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1439 N. 1st Street
Phoenix, Az. 85004
November 11, 1975

Mr. Paul L. Howard
State Director
Bureau of Land Management
125 S. State Street
Salt Lake City
Utah 84111

Dear Mr. Howard:

I am writing as land use chairman for the Arizona League of Women Voters to strongly oppose the establishment of a power line corridor through the Arizona Strip as proposed by Southern California Edison Company.

The League of Women Voters makes a public statement only after careful study of an issue. We have recently completed a three year study of land use goals and priorities for Arizona and also a national study on land use and two points seem particularly relevant here.

First is the importance of citizen input. The people must have a strong voice in determining the use of our public lands. The public has been overwhelmingly in opposition to power line rights of way across the Arizona Strip. (1970 Navaho-McCollach Line Hearings) It seems inconceivable that the same battles must be fought again and again until the public grows weary of the fight. The findings of the BLM study of the area five years ago are still valid today. The environmental standards that were being protected then are even more significant today as our unspoiled lands diminish. We urge that the testimony of the many groups and individuals given at the 1970 hearings be made part of the current record.

The League also supports protection of environmentally critical areas, areas of unspoiled scenic values and prime wildlife habitats. The Arizona Strip is one of the few remaining large blocks of unspoiled wilderness in our nation - a few primitive roads, no power or telephone lines, and with the finest mule deer habitat in the state. The proposed corridor would cut through this area, passing through the Paiute primitive area and a proposed primitive area in Nevada, as well as crossing the Hurricane Cliffs in one of the most scenic areas. The Strip would be open for the abuse of the land by off road vehicles as the BLM has no possibility of enforcing regulations in such a remote area. The argument of expediency and need for power

just does not measure up to the environmental degradation that will be the result.

Rather than establish a new corridor in this sensitive area, we urge consideration be given to the alternatives of following either of the two existing corridors to the north or south through the Navaho Reservation.

We appreciate the opportunity for input on this most important issue and will continue our interest in the future.

Yours truly,

Eva Patten
Eva Patten
Land Use Chairman
LWVA



Drawn by Nelson Walden

SIERRA CLUB *Utah Chapter*

63-B Elizabeth St., No. 4
Salt Lake City, UT 84102

13 November 1975

Paul L. Howard
Utah State Director
Bureau of Land Management
125 South State Street
Salt Lake City, UT 84111

Dear Mr. Howard:

The enclosed comments are to supplement those sent to you recently by John McCosh, Sierra Club Southwest representative. They are to be included in the hearing record as part of the Sierra Club's comments on the Kaiparowits draft environmental impact statement.

Sincerely,

[Signature]
Ruth A. Frear
Legal Chairperson
Utah Chapter

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COMMENTS OF RUTH A. FREAR, UTAH CHAPTER OF THE SIERRA CLUB, ON THE
KAIPAROWITS PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT, NOV. 1975

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The inadequacies of the draft EIS under consideration here have been well-documented ever since the hearings in September. I would like to reiterate a few points here.

A genuine need for the Kaiparowits project has not been justified. Information in the EIS justifying such need comes almost entirely from the utilities themselves. Demand increases forecast by the utilities have been seriously questioned by many experts for some time, yet no independent assessment of the need for all or part of the Kaiparowits power has ever been made. The Federal Energy Administration report in the reference volume of the EIS states: "Given the fact that utility demand forecasts are contested, independent predictions of future demand would be useful in assessments of the need for new generating facilities. But no such comprehensive projections have been made for the Kaiparowits market area. Those projections which have been made either are insufficiently detailed or rest on assumptions considered too speculative as a basis for planning." "Also not discussed are public policy options (e.g., redesign of electric power rate structures or mandatory conservation) which would have widespread impact on energy matters and, in so doing, might affect the need for Kaiparowits and/or the merits of its alternatives." (p.4-80; p.4-105) Also, "the FEA believes it important that there be forecasts compiled independently of those produced within the electric utility industry. Such forecasts would help to insure balance, they would lend greater credence to Government decisions permitting construction of generation and transmission facilities, and they would lead to more widespread participation in the economic planning process." (p.4-133) Such an independent approach is totally lacking, as is recognition of what effect mandatory conservation measures would have on the

to attain 99.5% removal of particulates, 90% removal of sulfur dioxide, and 31% removal of nitrogen oxide. But such machinery seldom achieves design efficiency. The water contract permits particulate removal to drop to 97%, thus increasing particulate emissions by 600%, a total of 72 tons per day. The great difference between design efficiency and operating efficiency, combined with the fact that there are no sanctions or incentives to encourage the plant's owners to meet any standards, makes figures and forecasts presented in the EIS inaccurate and essentially meaningless. In addition to air pollution, 7,245 acres of permanently-occupied land, 420 million tons of coal mined, 50,400 acre-feet of water taken from the Colorado River per year, 134.8 million cu. yds. of waste material to be deposited in a canyon and eventually flushed into Lake Powell, 1,632,400 cu. yds of aggregate taken, 3.8 million cu. yds. of limestone mined, 1,443 miles of transmission lines and 1,500 miles of permanent access roads constructed, and a population increase of 16,000 in an area presently having 7,000 residents--all would destroy the unique environmental, social, and historical qualities of this region.

Alternative locations for the Kaiparowits project are clearly not adequately dealt with in the EIS. Mipple Bench is the only alternative site considered in any detail, and others discussed at all are all near the Four Mile Bench location. This is totally unrealistic. Other sites in Utah such as the Price area, the Southwest portion of the state, the west central portion, were apparently not even considered, nor were possible alternate locations in California, Nevada, or Arizona. The EIS here is grossly narrow-minded, seemingly intent upon screwing up the nationally significant natural and scenic resources of Southern Utah and nowhere else.

As well, alternate energy sources are summarily dismissed ^{on the} grounds that no single one of them can generate 3,000 mw of electricity. The

1X-672

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load areas, or the possible effects of present and future price increases or peak load pricing. The rate of load growth projected by the utilities is based on historical data rather than on any data that reflects current conditions and trends. It is quite possible that the entire Kaiparowits project could be rejected without seriously affecting the real need for electric power in the participants' service areas. Another factor that should be considered here is Southern California Edison's purchase in August of 15.4% of the Palo Verde Nuclear Generating Station in Arizona. The public should be informed as to how this affects the demand forecast and the need for the Kaiparowits project. Also, according to the forecasts presented in the EIS, the Salt River Project was in great need of 10% of the Kaiparowits power. But SRP pulled out of the project. According to Fig. 22 on p. VII-368, withdrawing from the project would leave SRP with an inadequate reserve margin. Why did the Salt River Project decide that this was not so? A decision on whether or not to approve Kaiparowits based on such questionable information as that presented in the EIS would be totally irresponsible.

Environmental impacts of the Kaiparowits would be catastrophic. The air pollution alone would be a devastating blight on such a uniquely beautiful and fragile area. The Navajo plant at Page, with two units now operating for only a short time, produces an easily visible yellow-brown plume which can be seen for miles in any direction and at times obscures the view of Navajo Mountain from Bryce Canyon. As I recall, during the planning stages of the Navajo project, we were told that the plant would be equipped with all the latest pollution control devices and that it would be as clean as Kaiparowits will be if one is to believe the promoters of this project. I see absolutely no reason to believe that the Kaiparowits plant would produce any less pollution than is now pouring out of Navajo's stacks. Kaiparowits equipment, we are told, is designed

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fact is that no one source has to provide all 3,000 megawatts, but a combination of alternatives--solar, wind, and geothermal energy; various conservation measures; and other alternatives--can provide enough power to meet the needs proposed to be met by Kaiparowits. The spurious dismissal of alternatives on p.VIII-8 avoids the real issue. Needs can be met without the Kaiparowits project. 3,000 mw of electricity is not needed, right now, by just one single source.

Finally, the Kaiparowits project must be put in the context of the total energy development in the Southwest region. The EIS treats very inadequately the combined effects of the six existing (Cholla, Four Corners, Huntington, Mohave, Navajo, San Juan) and six proposed (Allen, Caineville-IPP, Emery II, Garfield, Kaiparowits, Warner Valley) coal-fired generating stations, as well as proposed gasification plants and mining and processing developments. The Kaiparowits project must not be treated as an isolated system. None of these various proposals should be considered independently of any or all of the others. All are in close proximity--in time as well as in geography--and all would seriously impair air quality, consume scarce water resources, require construction of thousands of miles of roads and transmission lines, require vast supplies of coal, and cause further rapid increases in population and social pressures in a sparsely-populated area. A comprehensive, regional environmental impact statement is needed to assess the collective impact of this regional development before the first step--Kaiparowits--can be taken.

In June of 1973, Interior Secretary Norton rejected the Kaiparowits project in order to protect the natural values of the area. This draft environmental impact statement strongly reaffirms the wisdom of that decision.

SOCIAL CONSEQUENCES OF IMPACT GROWTH
ASSOCIATED WITH ENERGY DEVELOPMENT

ElDean V. Kohrs, Ph.D., - Casper, Wyoming

The growing concern about social consequences of impact growth is indicated by an average of at least a request a week for my paper entitled, "Social Consequences of Boom Growth in Wyoming." That paper clearly outlined the geometric cost increases when a community doubles in size in a short period of time. Since that paper was written, the "Gillette Syndrome" has been experienced in other towns, such as Rock Springs.

A more recent study that I completed compared the low-growth counties of Sheridan, Goshute and Johnson with the high-growth counties of Sweetwater, Carbon and Campbell Counties in Wyoming. The low-growth counties had an increase in population of under 6 per cent while the high-growth counties had experienced well over 6 per cent increases from 1970 to 1973, with the exception of Campbell County in which the increase had occurred just prior to 1970. The per cent change in each of the counties and the change in school enrollments can be noted in Table A. It will also be noted on this chart

Insert Table A about here

that the per cent of school-age children in the low-growth counties were 4 to 5 per cent lower than in the high-growth counties where they tended to be 26 per cent of the total population. This has resulted in an increase in a number of classrooms required to accommodate these children. This has been a problem in high-growth counties because the taxation money was not available before the classrooms were actually needed.

EDUCATION AND SCHOOL ENROLLMENT

	LOW GROWTH COUNTIES		HIGH GROWTH COUNTIES		Per Cent Enrollment			
	Per Cent Enrollment $\frac{1970}{1960}$	School Enrollment $\frac{1970}{1960}$	Per Cent Enrollment $\frac{1970}{1960}$	School Enrollment $\frac{1970}{1960}$				
Sheridan	17,453	18,900	+ 5.9	4,114	4,674	21	- 70	-212
Goodhue	10,798	11,400	+ 4.8	2,603	2,693	24		
Lincoln	4,335	5,380	+ 1.6	1,363	1,709	22		-354
HIGH GROWTH COUNTIES								
Sweetwater	18,393	22,300	+25.3	4,556	5,803	26	+1,209	
Carbon	13,354	15,500	+16.1	3,437	3,691	25	+453	
Campbell ^b	12,597	11,957	- 0.4	2,979	3,060	26	+181	

Enrollment

a. Per cent growth from 1960 to 1970 was 0 per cent.

b. Per cent growth from 1960 to 1970 was 121 per cent.

A second serious social consequence is in the area of law enforcement. It could be noted in Table B that the per cent of population from which

Insert Table B about here

arrests were made is generally higher in the high-growth counties than in the low-growth counties. The one exception is Sheridan in the low-growth counties and Carbon in the high-growth group. The number of total arrests are considerably higher in the high-growth counties than in the low-growth counties. It can also be noted that the criminal costs per person in the low-growth counties are about half that of the criminal costs per person in the high-growth counties. Of the high-growth counties, Campbell County was the highest with an expenditure of \$37.72 per person for criminal costs. This contrasts with the high in Sheridan and Goodhue Counties of \$17.66 per person.

Another area of concern is that of delivery of health services. Using the recommended number of health professionals per population, it can be noted that there is a shortage in all counties of physicians and dentists.

Insert Table C about here

It can be further noted that the most severe shortages were in the high-growth counties where Sweetwater County had almost half as many physicians as would be recommended by the Public Health Service, as did Campbell in 1973.

While advance planning might have prevented some of the social consequences noted in the above charts, the initial problem is still how to obtain from money to provide services that will be needed prior to the great influx of people. Until this problem can be resolved, there will continue to be the kind of social consequences resulting in inordinate costs per capita and an increase in the number of casualties requiring mental health services.

TABLE C
HEALTH PROFESSIONS

Represented per population:

Physician	1,000
Dentist	1,600
Pharmacist	1,485
Nurse	614
Optometrist	7,000

	Provision	Dentists	Optometrists
Everedon	19 (16) ^a	12 (17)	2.5 (3)
Guthrie	11 (10)	8 (3)	1.5 (1)
Johnson	5.5 (2)	4 (2)	1.0 (1)
Superior	22.5 (14)	14 (9)	3 (4)
Carbon	19.5 (13)	10 (7)	2 (2)
Campbell	12 (5)	8 (3)	2.5 (2)

Footnote:

a. Actual in 1973

TABLE D

1973

ARREST AND ALCOHOL FIGURES

	Actual Offenses	Per Cent Population	Number Arrested	ALCOHOL OFFENSES						Total Alcohol Arrests	CRITICAL COSTS		
				PER 1000							Total	Per Person	Per 1000
				1970									
				1970	1973	1973	1970	1973	1973				
Shawdon	518	2.74	130	164	315	77	28	27	11	624	16.48		
Guthrie	31	.27	31	47	64	73	20	65	5.3	244	9.71		
Johnson	43	.78	4	58	22	15	58	18	25	222	10.57		
Ketchikan													
Superior	1,048	4.65	57	135	415	134	63	199	55	1,370	23.42		
Carbon	182	1.17	121	56	68	7	20	28	25	466	22.51		
Campbell	319	2.70	75	134	77	48	98	86	56	472	28.37		

FIVE SECTORS

Kaiparowits Environmental Impact Statement (EIS)
Comments and Critique - Emissions and Air Quality

This paper is a discussion and critique of the sections of the EIS for the proposed Kaiparowits electric generating plant dealing with stack emissions and their effects on air quality and the environment.

The most serious general criticism of the EIS air quality and emission sections concerns the method of predicting air pollutant concentrations and effects from Kaiparowits. These predictions are based primarily on studies prepared or contracted by Southern California Edison using computer models favorable to their position and limited test data from test modules only. No independent studies have been made, nor is there much use of actual field data gathered from similar operating plants.

Considering the fact that a number of generating plants have been operating in the area for some time, the almost complete absence of field data and the almost complete reliance on one computer model (even when the EIS acknowledges there is no generally accepted model) is inexcusable. The result is a falsely optimistic prediction of the effect on air quality in the area, and in some cases is in direct contradiction to the limited field observations reported.

Specific pollutants and effects are treated below.

I. Emissions

A. Particulates.

(1) The EIS indicates 99.5% of the fly ash generated by the plant will be removed. It must first be noted, however, that while the water contract requires an initial design capable of removing 99.5% of the particulates, only 96% removal for a 24 hour period and 97% removal for a month's period are required (IV-22). This is a rather large difference in the amount of emitted

particulates: 97.9 tons/day and 73.4 tons/day as compared to 12.2 tons/day. Thus, although the plant must be designed with a 99.5% removal capability, it is required by the water contract to remove considerably less particulate. This difference between design capability and actual required removal capabilities should be emphasized in the EIS.

(2) While the state of the art for electrostatic precipitators makes it possible to remove 99.5% of the particulates, actual operating data from plants so equipped (Huntington, Mohave, Four Corners, e.g.), indicating the actual amounts removed, should be included in the EIS. A recent report by TVA on the efficiencies of 15 plants equipped with precipitators indicates only one is operating at design efficiency, with the difference varying from a few percent up to 40% lower. It is not clear to what extent the 99.5% predicted removal figure is based on manufacturers specifications, test modules or actual operating data. The inclusion of operating data would increase confidence in the 99.5% removal prediction; in this respect, the EIS is inadequate.

B. Sulfur Dioxide

(1) The EIS indicates 90% of the sulfur dioxide will be removed from the stack gases. Again, it must be pointed out, the most stringent requirement for sulfur dioxide removal is 80%, imposed by the State of Utah (IV-33, III-16). This requirement is currently under consideration for revision which might allow, under certain conditions, even lower removal. At 80% removal 68.4 tons/day of sulfur dioxide will be released, rather than 34.2 tons/day at 90% removal. This important distinction should be emphasized in the EIS.

(2) The 90% removal figure is based primarily on results with a 170 mw test module at the Mohave plant operating over the period January 16, 1974-February 9, 1975. Unfortunately, operating data for actual plants of reasonable size are not available, since none exist. While the data from this test period support the prediction, it is necessary to realize there may be

considerable difference in the results for a one year operation of a 170 mw test module and a 35 year operation of a 3000 mw plant. There has indeed been considerable controversy over the operational reliability of the wet-scrubber process (see attached advertisement, "Requiem for Scrubbers", published in Time, October 14, 1974, p. 73, or the report of the Commission on Natural Resources, National Academy of Sciences, National Academy of Engineering and National Research Council entitled "Air Quality and Stationary Source Emission Control", U.S. Government Printing Office, 1975, 9-g.). While the present state of the art is rapidly improving, predictions of 90% removal of sulfur dioxide for large commercial generating plants must be regarded as unproven. This point should be made clear in the EIS.

C. Nitrogen Oxides

It is estimated the Kaiparowits plant will emit 250 tons of nitrogen dioxide per day under average conditions. Since the nitrogen dioxide is a major factor in plume opacity and is involved in a number of important photochemical reactions contributing to a deterioration of air quality (discussed below), the amounts of this pollutant are of considerable importance. It is difficult, however, to know what 250 tons/day of nitrogen dioxide means without some comparisons. In this section, an attempt is made to obtain some sort of feeling for this quantity of pollutant.

It is well known that a major source of air pollution in cities is the automobile engine. Furthermore, pollutants of major concern are the nitrogen oxides, formed by combustion in the engine. On the average, an automobile engine without controls emits about 5 grams of nitric oxide/mile of driving. This corresponds to about 7.5 grams/mile of nitrogen dioxide. Assuming 100,000 automobiles and trucks operating 20 miles each day in the Salt Lake valley, a total of 15,000,000 grams of nitrogen dioxide are produced from this source each day in the area. This is equivalent to 16.5 tons

of nitrogen dioxide/day. Thus, the Kaiparowits plant will emit about 15 times as much nitrogen dioxide/day as all the cars operating in the Salt Lake valley. This calculation, of course, is only approximate, depending on the validity of the assumptions. It does indicate, however, the magnitude of the amount of nitrogen dioxide to be emitted into the atmosphere by the plant during average operating conditions. Another comparison shows the NO_2 to be emitted is approximately 20% of the total (all sources) NO_2 produced in the whole Los Angeles basin. Clearly, this is an enormous amount of this pollutant, which may lead to high levels of photochemical oxidants (see below). Comparisons similar to this should be made in the EIS to provide a true feeling of the amounts of all pollutants to be emitted.

D. Mercury

The trace metal mercury is a particularly dangerous pollutant since, under aquatic conditions, it is converted by bacteria of the sediments to methyl mercury and concentrated in fish (and other species). In addition to being a deadly poison, methyl mercury is perhaps the most mutagenic chemical known and has been the cause of a number of recent tragedies.

According to the EIS, the Kaiparowits plant is estimated to release 4 pounds of mercury/day from the combustion of the coal. This seems to be a very small amount of mercury. Again, however, a comparison is necessary in order to assess the possible effect of this deadly pollutant.

It is reported in the EIS that mercury levels in some fish in Lake Powell are already very high (greater than 500 ppb, exceeding the upper recommended FDA limit for human consumption, 111-154). The method used to estimate mercury levels is reported to give low results, and this figure

*Table P78.
Oct 1974, 14*

should be multiplied by 1.5 (J. M. Wood, Environment, 14 33 (72)), while the average concentration of mercury in the lake water is .01 ppb. Using the figure of 27,000,000 acre-feet as the volume of water in Lake Powell (III-155), a simple calculation indicates the presence of 734 lbs. of mercury present in all the water of Lake Powell. If the plant emits 4 pounds mercury/day, this amounts to 1460 lbs. of mercury/year. In other words, the amount of mercury emitted in a year is about twice the total amount of mercury currently present in all of the water of Lake Powell. A more meaningful comparison, however, is with the current estimated annual accumulation of mercury in Lake Powell from natural sources. According to recent studies (D. R. Standeford, L. D. Potter and D. E. Kidd, Lake Powell Research Project Bulletin, No. 1, June, 1973), 1760 lbs. of mercury/year accumulate in Lake Powell sediments from weathering in the basin. If 32% of the emitted mercury from Kaiparowits enters the system (E. G. Walther, "Mercury Emission from Navajo Generating Plant", Museum of Northern Arizona, Flagstaff, Arizona, 1971) this will add an additional 467 lbs./year, or an increase of 27%. This puts the amount of mercury to be emitted in the proper perspective. The possible effects of this will be discussed below. Again, the EIS is deficient in not making meaningful comparisons with regard to the amount of such pollutants, and in not pointing out the possible dangers of poisons as methyl mercury.

II. Effects

In general, the effects on air quality and plume opacity of particulate and sulfur dioxide emissions discussed in the EIS may need to be increased if the figures anticipated for removal are in fact not attainable for sustained operation of a plant of 3000 mw. This possibility is supported by observations of the plume of the Navajo plant. According to the EIS predictions, based

The advertisement features a large, dark, arched tombstone graphic in the upper center. Inside the tombstone, the text reads: "If a scrubber is not installed, the plant will be a permanent source of pollution." Below the tombstone, the headline "Requirements for scrubbers" is written in a large, stylized font. Underneath the headline, there is a grid of small, illegible text blocks, likely representing various data points or specifications. At the bottom of the advertisement, the text "American Electric Power System" is visible.

primarily on computer model studies, the plume from the Kaiparowits stack will be visible only along its axis under average conditions. This is in contradiction to the observations of the plume from the Navajo plant, which is reported to be visible from all angles (III-3, III-48, III-47, V-14). It should also be pointed out, the Navajo plant is currently operating only two 750 MW unit; Kaiparowits will be operating four such units, so the visibility of the plume will be considerably greater than that of the Navajo plant (both plants are presumably equipped with similar particulate control equipment). This contradiction between computer studies and observations may be due in part to a lower operating removal efficiency of the control equipment in practice than that used in the model studies (in addition, while sulfur dioxide is itself colorless, it is converted, in part photochemically, to sulfur trioxide which combines with water in the atmosphere to form a cloudy aerosol mist adding to the opacity of particulates). Furthermore, the contradiction suggests the computer model used for predicting opacity and air quality may be faulty (see errata sheet, EIS, page III-24 and the discussion concerning nitrogen dioxide below). This contradiction between observation and prediction with respect to plume opacity and visibility is one of the most serious failures of the EIS. Operational data from the Navajo plant would go a long way in correcting this failure.

A major criticism of the EIS concerns the levels of nitrogen dioxide predicted by the computer models. While Figure 7 (III-28) gives the predicted annual level of nitrogen dioxide as $12 \mu\text{g}/\text{m}^3$ (.007 ppm), it does not give the 24 hour nor 3 hour levels of this pollutant. Using the relative respective

source strengths (as compared to sulfur dioxide, III-29), the figures are $241 \mu\text{g}/\text{m}^3$ (.11 ppm) for 24 hours and $980 \mu\text{g}/\text{m}^3$ (.43 ppm) for 3 hours. Furthermore, as described in the errata sheet, Chapter III-24, the use of the NOAA model (Southwest Energy Study) gives much higher (5-20 times) 3 hours levels of sulfur dioxide at three sites (Figure 6). Use of this model for nitrogen dioxide gives $2226 \mu\text{g}/\text{m}^3$ (Kaiparowits plateau, South), $1703 \mu\text{g}/\text{m}^3$ (Kaiparowits plateau, North), and $995 \mu\text{g}/\text{m}^3$ (Right hand Collet) (See Figure 6, III-25). While there are no 3 hour or 24 hour nitrogen dioxide air quality standards (Figure 7), such high levels are a cause of great concern, particularly with respect to photochemical oxidants (see below). This enormous discrepancy between model predictions also indicates the annual level of nitrogen dioxide predicted by the Intercomp Model ($12 \mu\text{g}/\text{m}^3$.007 ppm - Figure 7, III-28) may be low by a comparable factor. If it is in fact a factor of 10 higher, the annual level of nitrogen dioxide will exceed ambient primary air quality standards (Figure 7). Clearly, such enormous differences in the predicted levels undermine any confidence in the repeated assurances that air quality standards will be met. Much more data, preferably from an operating plant, comparing actual levels of nitrogen oxides with model predictions is necessary before the EIS figures for this pollutant can be accepted.

In addition to these considerations, the effects of specific pollutants are discussed below:

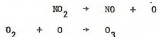
A. Sulfur Dioxide - Sulfuric Acid

As mentioned, sulfur dioxide is converted photochemically to sulfuric acid in the atmosphere. During rainstorms this acid is brought to the earth, decreasing the pH of land and water. Rain and snow from various parts of the U.S. and Northern Europe, e.g., have been reported to have a pH ranging from

3.5 to 5, corresponding to an acidity more than 100 times that of neutral water. The most dramatic effects are seen in lakes, where the pH may drop so low it endangers the aquatic biota. Due to the proximity of Lake Powell to Kaiparovits, this increase in acidity due to sulfur acids may be serious, but the EIS makes no mention of it. It is, of course, difficult to predict the magnitude of this effect. If all the sulfur dioxide to be emitted by Kaiparovits were converted to sulfuric acid and dissolved in Lake Powell, and if the waters of the Lake were completely mixed and no outflow occurred, in one year the pH of the Lake would be lowered from 7 to 5, which would perhaps endanger the biota. Of course, such a calculation, because of the assumptions made is rather meaningless. It does point out, however, that if a substantial amount of the sulfuric acid that will be formed by the plant gets into the lake, serious local effects in some of the many shallow bays may be anticipated. Clearly, more data is necessary to evaluate the long term effects of sulfur emissions on the acidity of Lake Powell.

B. Nitrogen Dioxide - Photochemical Oxidants - Ozone

The EIS discusses the effect of nitrogen dioxide (yellow-brown in color) in increasing the opacity of the plume and decreasing visibility. It makes no mention of the photochemical reactions of nitrogen dioxide. Nitrogen dioxide undergoes photochemical decomposition to produce nitric oxide and oxygen atoms. The oxygen atoms react with oxygen of the atmosphere to produce ozone, a powerful oxidant and a major factor in air pollution:



The ozone formed is partially removed by reaction with nitric oxide:



In areas of high sunlight (as Kaiparovits), considerable amounts of ozone are to be anticipated when nitrogen dioxide levels are high. Ozone attacks organic

matter (including organic molecules in living systems) rapidly. Using published data (P. A. Leighton, "Photochemistry of Air Pollution", Academic Press, New York, N. Y., 1961) for the rates of these three reactions, it is possible to estimate the maximum levels of ozone to be formed. Using the annual predicted level of nitrogen dioxide of Figure 7 (.007 ppm), this gives .005 ppm ozone. The corresponding 24 hour and 3 hour levels are, respectively, .03 ppm and .07 ppm. If the much higher levels predicted by the MOSA model are used (see above and errata sheet) for the three sites designated in Figure 6, the corresponding ozone levels are .10 ppm, .09 ppm and .07 ppm. Two of these levels exceed the federal air quality standard of .08 ppm (which may not be exceeded more than once a year) (figure 2, III-17) and constitute a violation of Class II standards. Also, these levels are close to the maximum allowable industrial exposure of .1 ppm. Such amounts, in addition to possibly being hazardous to workers at the site, particularly during air stagnation periods, would likely be harmful to plant life in the area. Considerable damage to plants and trees has been observed in areas of high ozone concentration (Los Angeles, e.g.). It must be pointed out, however, these calculations are based on the assumption stated in the EIS that all NO in the stack gases is oxidized to NO₂. This, of course, is unrealistic, and the corresponding ozone concentrations will be lower than these calculated values, depending on the actual NO₂/NO ratio. The problem, however, is much more complicated than this. A recent study of ozone levels in generating plant stack gases indicates the plume is depleted in ozone near the plant (probably due to the third reaction above) but in fact becomes a net producer of ozone some distance from the plant. This was

explained in terms of a catalytic oxidation of NO by a photochemical process involving highly reactive sulfur oxide intermediates. This, of course, makes prediction of actual ozone levels very difficult indeed. In view of the enormous amounts of NO_x to be produced by Kaiparowits, however, the possibilities of high ozone levels must be taken seriously. Clearly, more studies of ozone production are needed before the effects of this pollutant can be evaluated.

C. Mercury

The amount of mercury that will be emitted is reported to be 4 lbs./day. This is probably too high, since about 10% will remain in the ash (C. E. Billings and W. R. Watson, Environmental Science and Technology 176, 1232 (1972)) and an unknown amount will be trapped in the scrubber. If 80% of the mercury (3.2 lbs./day) is emitted, this amounts to 1168 lbs./year. If 40% of this amount enters the Lake Powell system, it will add 467 lbs./year, as compared to 1760 lbs./year accumulated from natural sources (Standeford, et al., 1973), an increase of 27%. This will increase the mercury levels in large game fish from 550 ppb to an estimated 769 ppb, making them unsafe for human consumption (FDA maximum levels are 500 ppb). The accumulation over a 35 year period, calculated in the same way, gives over 16,000 lbs. of mercury which may be added to the system from Kaiparowits. How much of this will remain in the lake (mainly as bottom sediments, where it is converted by bacteria to the lethal methyl mercury), and how much will accumulate in fish is unknown. It does seem safe to say, however, the game fishing in Lake Powell will be destroyed, due in part to the mercury emitted by Kaiparowits. The EIS is certainly inadequate in treating the mercury emission problem of the plant.

III. Cumulative Effects of Power Plants on Air Quality and Emissions

Currently there are eleven electric power generating plants, with a combined capacity of 18,690 ^{mw} in operation or planned (by 1985) within 200 miles of Kaiparowits. The EIS (VI-4) gives little attention to the combined effects of the pollutants of these plants. Although the pollutants of one plant may not contribute to the pollution of another at the plant sites, (although this is certainly open to question. Since the Navajo Plant is not equipped with SO₂ removal equipment, the concentrations of SO₂ from the Navajo plant in the Kaiparowits area may be substantial under the right meteorological conditions) the combined effect will be to considerably reduce air quality and visibility over an enormous area -- approximately 100,000 square miles of Utah, Arizona, New Mexico, and Colorado. One of the important ways proposed to ameliorate air pollution is by dilution with clean air. If, however, each plant is effectively polluting its immediate area to the extent contemplated at Kaiparowits, little dilution can occur, and air quality will be lost over the entire region.

The cumulative effect of other pollutants should also be considered. If the mercury emissions of the Navajo, Four Corners, Kaiparowits, San Juan, IPP (Caineville) and Garfield plants (all in the Lake Powell system) are taken together, and the same calculations applied as for Kaiparowits alone, an estimated 2335 lbs./year of Mercury will accumulate in Lake Powell sediments. This is compared to 1760 lbs./year from natural sources, an increase of 133%! Again, the same calculations as for Kaiparowits give an increase in mercury (as methylmercury) in game fish from the present 500 ppb to 1345 ppb (compared to FDA levels of 500 ppb).

One major weakness of the EIS is its lack of treatment of these combined problems. Serious studies should be made to determine the total effect on air quality, visibility and emission impacts for the entire area when all the plants (or a substantial number) are in operation. Kaiparowits cannot be considered on an isolated basis.

IV. Summary and Conclusions

A. Predicted emissions of particulates and sulfur dioxide may be low in view of the limited data base on which they are made and operational evidence concerning the reliability of the equipment. Misleading statements concerning the actual required emissions as compared to design capabilities should be changed.

B. Different models give contradicting results concerning the concentration of sulfur dioxide at various sites, undermining confidence in the models used. When both models are applied to nitrogen dioxide levels, very high concentrations of this pollutant are obtained, which will most likely violate primary air quality standards.

C. Model predictions of plume opacity and visibility are at variance with observations of the Navajo plant plume, again indicating the unreliability of the air quality models.

D. The EIS either ignores or does not treat adequately the effects of the following pollutants:

(1) Sulfuric acid. Produced by photochemical oxidation of sulfur dioxide, much of the sulfuric acid may enter Lake Powell, raising the acidity, particularly of shallow bays, to the point of endangering the biota.

(2) Ozone (Photochemical Oxidants). Produced by the photochemical dissociation of nitrogen dioxide, ozone levels may exceed air quality standards for photochemical oxidants for Class II areas. Serious effects on plant life are anticipated.

(3) Mercury. While the expected emission of mercury appears small, the yearly amounts actually exceed the total already present in Lake Powell waters. Certain game fish in the lake already contain mercury (methyl mercury) in excess of FDA standards and the addition of appreciable amounts from stack emissions will most probably result in the destruction of the game fishing on the lake. The dangers associated with bacterial conversion of mercury to the deadly poison and mutagen methyl mercury (accumulated by the fish) are not explored.

E. Cumulative effects of the 11 planned and operating generating plants in the area with respect to air quality and environment are inadequately considered. Kaiparowits is treated as an isolated system.

In view of these considerations, the sections of the EIS concerned with pollutant emissions and their effects on air quality and the environment are deemed severely inadequate. Much more data, particularly from operating plants, is needed before decisions concerning the environmental impact of Kaiparowits can be rationally made.

Jack T. Spence, Ph.D.
Professor of Chemistry and Biochemistry
Utah State University
Logan, Utah 84322



United States Department of the Interior

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092

OFFICE OF THE DIRECTOR

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NOV 12 1975

Memorandum

To: State Director, Bureau of Land Management
Salt Lake City, Utah

Through: Assistant Secretary -- Energy and Minerals

From: ^{Assistant} Director, Geological Survey

Subject: Review of draft environmental statement for Kaiparowits Power Project, Utah

We have reviewed the subject draft environmental statement as requested in your memorandum of September 23.

The environmental statement is unusually comprehensive in virtually all respects, noteworthy features including: (1) useful maps and other illustrations; (2) useful discussion of geology and related environmental impacts; (3) concise discussion of mining and quarrying operations; (4) complete coverage of those aspects of plant engineering design and planning that are related to environmental impacts; (5) good organization of the statement; and (6) the 49-page bibliography.

The proposed "new town" and its impacts have been discussed with scarcely any mention of Glen Canyon City (for example, p. I-323 to I-334), which would evidently be encompassed by the development. We failed to find a description of the existing settlement. Illustration I-68 appears to show the proposed new development surrounding and encompassing the area of Glen Canyon City, but since the latter has not been clearly delineated or identified on that map, considerable doubt remains about the relationship of the two settlements. Illustration I-67 shows the new townsite as completely contiguous with Glen Canyon City. By contrast, Illustration I-69 shows each settlement completely distinct, and four miles apart. The most detailed map, Illustration I-58, on the other hand, shows a single settlement encompassing what appears to be the major part of both communities within a single perimeter road having an average

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diameter of only 1.4 miles. The overall length of the combined community, as shown on that map, is 2.3 miles, while on Illustration I-67 it is 4.3 miles and has a very different configuration from that shown on Illustration I-68. It would be helpful to clarify these relationships.

The effects of the proposed action on the chemical, biological and physical quality of surface water are adequately discussed and the proposed mitigating measures should assure minimum impact on the hydrologic environment. We suggest no improvement, however. The environmental statement indicates that evaporation ponds and sanitary waste ponds will be monitored for leakage to assure no degradation of ground water or return of waste water to Lake Powell (p. I-101). The chemical-quality monitoring program should also include selected areas of Lake Powell in order to detect either seepage from evaporation ponds, tailings ponds, and sanitary waste-water ponds that may not be detected by on-site monitors or runoff from the project area that may tend to increase the salinity of the lake. Increases in salinity of drainage from Lake Powell may influence any increases in salinity of the Colorado River resulting from the proposed action.

A few points related to ground-water resources should be addressed more fully or clarified.

(1) Ponds are to be lined with a two-foot layer of mudstone having a permeability coefficient of 0.05 feet/year (p. I-100 to I-101). We would like to know whether the linings are to consist of crushed material from the mudstone that has been compacted or cemented, or consist of blocks cemented together. Is the stated permeability of laboratory or field determination applicable to undisturbed mudstone, or is it the predicted permeability for the liner in place? Inasmuch as the liner is intended to provide pond integrity against leaks for the projected 35-year life of the plant, it is part of an important mitigating measure proposed to protect ground-water resources. The statement should explain this matter more adequately. Further, for proper appraisal of the impact evaluation, the statement should describe the mineral and textural nature and pertinent properties of the mudstone both in its undisturbed condition and after use in the liners. If no cementing is planned, it should be explained how slumping and loss of integrity will be avoided on the flanks of the ponds.

(2) The monitoring system around the ponds should be more fully explained. According to the draft statement the depths to ground water will be fairly great, up to 1,000 feet or more, if the principal aquifer is monitored (p. II-3). Of course, there is always the possibility that perched water bodies may underlie each pond, perhaps at depths of 150 to 200 feet.



Save Energy and You Serve America!

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Kaiparowits Power Project

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Nevertheless, there seems to be a good possibility that any pollutants escaping from the ponds may initially move downward and not laterally through unsaturated or dry rocks for hundreds of feet before entering the regional flow of ground water. Will the monitoring wells be drilled to perched bodies, if they are found under each pond, or to the principal aquifer (the Navajo Sandstone)? Or will slant drilling also be used to try to intercept pollutants beneath the ponds before they enter the principal ground-water reservoir? About how many monitoring wells are planned and roughly what distribution are they to have?

(3) On page I-152 the statement is made that mine-drainage water would be recycled for use underground and that if excessive quantities of water should be generated, any surplus over mining requirements would be piped to the coal preparation plant. On page III-115, however, the text states, "Water produced at the mines would not be returned to the ground-water systems or released to streams. This would result in depletion of a number of seeps and springs . . ." The significance of these two statements should be clarified and any possible differences reconciled.

We have the following additional suggestions.

Page I-6, par. 2 -- The figure of 47,128 acres should be modified to account for exchanges with the El Paso Natural Gas Company and to agree with the figure of 47,767.79 acres given on page A. 156.

Page I-6, par. 3 -- For clarity and emphasis the first sentence should be extended to read "... covered conveyor belt approximately seven miles long to transport clean coal to the generating station at Four Mile Bench."

Page I-8, par. 3 -- The limestone quarry is described as "approximately 16 miles northwest of Bryce Canyon National Park" here and on page I-251 but as approximately "20 miles north" of the park in the Summary (following the title page). However, illustration II-4 shows the proposed quarry site to be 11 miles from Bryce Canyon National Park in a north-northeast direction.

Page I-116, par. 3 -- Change the acreage from 47,128 to 47,767.79 and include Range 2 in the description, shown in illustration 21.

Page II-68, illus. 8 -- It would be useful to identify the site of the coal mine, on the bench between Warm Creek and Last Chance Creek.

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Kaiparowits Power Project

Page II-71, illus. 10 -- A credit line should be added: "From Doelling and Graham, 1972."

Page II-73, fig. 23 -- Credit line should be expanded to read "Modified from Doelling and Graham, 1972."

Page II-78, par. 4 -- The original "Illustration 10" intended to show transition of coal zones has been omitted. We recommend deletion of the sentence. The present illustration 10 is a generalized geologic map.

Page III-61, par. 2 -- The thickness of "20 to 25 feet should be changed to "30 to 3½ feet," in agreement with last paragraph on this page.

Page IV-11, par. 2 -- We believe the reference to OSHA is at least partially in error. Respirable coal dust standards were drawn up by HEW and U.S. Bureau of Mines for inclusion in the Federal Coal Mine Health and Safety Act of 1969. These provisions were subsequently enforced by the Health and Safety arm of USBM until the Mining Enforcement and Safety Administration (MESA) replaced the Health and Safety portion, USBM, in 1972. However, it is possible that OSHA has adopted similar guidelines for its areas of responsibility, which do not include coal mines and coal mine surface facilities. The latter are strictly under MESA's jurisdiction. OSHA does, however, cover industrial facilities, such as a power plant per se, and probably the seven-mile coal conveyor to the power plant in this instance.

Similar comment applies to the reference to OSHA in the last paragraph of page IV-19. These working stations in a mine or within surface-related facilities are strictly within MESA jurisdiction and OSHA has no authority whatsoever. The remaining references to MESA on page IV-20 are correct and proper.

Page IV-20, last par. -- Mitigating measures to prevent subsidence alluded to here, although discussed in Chapter I and on page IV-31, should also be emphasized here with a reference to page IV-31, even at the expense of repetition. Subsidence may be one of the greatest impacts of the project.

Page IV-30 -- Regulatory enforcement powers of the U.S. Geological Survey as to Coal Mining Regulations, 30 CFR, Part 211, should be mentioned here. This matter deserves more emphasis than it is given on page IV-31.

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Page VIII-63, par. 1 -- Reword to read "... 40 feet or more of thickness," since some coal beds not technologically recoverable by underground methods could be mined by the open pit technique.

Page VII-64, line 7 from bottom -- Change "seam" to "bed".

Page VII-67, par. 2 -- It should be mentioned that additional water would be required to mix with pulverized coal to produce a slurry and special equipment would be needed to make the mix. In addition, dewatering equipment would be needed on the delivery end. This method would take up more acreage and contribute to surface disturbance and other impacts.


Acting Director

cc:

AS-EM (2)
Director, PEP
(Encl. Advance)
Gen. Files
Dir. Chron
108
RU 760
McCann Chron
Bonham Chron
LBonham:cg
11/5/75: 860-7493

IX-665



Northern Arizona Council of Governments

P.O. BOX 57 • FLAGSTAFF, AZ - 86001 • (602) 774-1895

WILLIAM C. WADE
EXECUTIVE DIRECTOR

November 13, 1975

Mr. Paul Howard
State Director
Bureau of Land Management
125 S. State Street
Salt Lake City, Utah 84111

Dear Mr. Howard,

The Northern Arizona Council of Governments would like to comment on the proposed Kaiparowits Project, particularly as it affects the Northern Arizona region. There is keen local interest in this project, much of it based upon insufficient or incorrect information about the proposed project and its possible economic and environmental consequences.

This Council of Governments, representing all of the Counties and Incorporated Towns and Cities in Arizona Planning Region III, has always encouraged economic growth for this region, for the State of Arizona, and for the Southwest in general. However, in the present case, we are concerned that the benefits realized from the short range economic growth in the Kaiparowits area may be more than offset by long term economic losses suffered as a result of significant atmospheric degradation or possible contamination of Lake Powell. The loss in tourist spending may, in the long run, exceed the income added to the area due to plant, mine and transmission line construction. We do not know that this will happen; we certainly hope that it does not. We are, however, not reassured by the Environmental Impact Statement which, we believe, pays insufficient attention to the relationship between air quality and tourism and to the question of mercury contamination of Lake Powell.

Regarding the question of transmission line siting, we believe that the long term effect of power lines on both the vegetation and wildlife in the surrounding area are, at best, only partially understood. Therefore, the use of existing corridors is to be preferred to creation of new corridors, where feasible. We particularly oppose new transmission corridors in areas where a sensitive balance in the ecosystem exists, where

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November 13, 1975
Page 2

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experimentation with new or renewed species of plant or animal life is being carried out, where significant archeological discoveries are being made, or even where the lines would intrude on scenic vistas of natural beauty.

In view of recent decisions by the Project participants to revise downward their plans for future power needs and power sources, we believe that the additional study required to properly address these questions is warranted. In particular, we would like the Environmental Impact Statement refined to include the following considerations:

1) When is the last date at which the power plant go-ahead could be given without seriously threatening the energy reserves of the remaining project participants? It is our understanding that Arizona Public Service Company has delayed the construction of the last unit of their coal-fired Cholla Power Plant near Joseph City, Arizona to reduce capital commitments and because of uncertainties in future power needs. Also, Tucson Gas and Electric Company has recently withdrawn from participation in the Palo Verde Nuclear Generating Plant in Western Maricopa County, Arizona, and assigned their interests to Southern California Edison Company, thus perhaps changing the need for that company to depend so heavily on participation in the Kaiparowits Project, has recently scaled down construction plans for their Coronado Generating Plant in St. Johns, Arizona. Since the service areas of Arizona Public Service and Salt River Project are at least adjacent, it is possible that APS could buy power from SRP, thus minimizing the need for new transmission lines, and minimizing the need for APS to depend so heavily on the Kaiparowits Project.

2) It is our understanding that the cost of generating power at the Kaiparowits plant is estimated to be very high by present standards (perhaps over 30 mills/kwh) so that consumer resistance to high energy costs must be considered in forecasting future demand. Since no independent energy demand forecasts have as yet been made, the services of a well known and competent organization, such as the Rand Corporation, should immediately be engaged to produce an independent estimate of future electrical power demands for each of the remaining principals. The results of this independent demand forecast should then be compared with the demand forecasts used in this EIS. (This proposal was suggested by the Federal Energy Administration on page A-80 of the Reference Material volume of the EIS.) Of particular concern are the revised 1985 demands and how these are related to energy conservation measures and the ever-increasing cost of electrical energy. The size and scheduling of the plant should then be re-examined, as well as the use of other generating facilities.

3) Building a new town, near the present settlement of Glen Canyon City, Utah, is not supported because the already-developed commercial and entertainment facilities of Page, Arizona, will cause many (if not most)

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Mr. Paul Howard
November 13, 1975
Page 3

of the new town's people to make frequent trips to Page. It is suggested that the total adverse environmental impact of the increased population would be lessened if the newcomers were encouraged to settle in Page, which is currently losing population due to completion of the Navajo Power Plant. Transportation to the Plant and the coal mine can more efficiently be handled by large buses and by car-pooling, thus saving both gasoline and increasing highway safety. Some people may wish to live nearer the plant, and the already existing private land near Glen Canyon City may accomodate some of them. "Bachelor Quarters" should be provided at the plant site, the mine site and in Page for temporary housing of certain workers. Buses should also be operated from Kanab, Utah to the plant and mine sites to allow workers this additional choice.

In conclusion, we wish to reiterate that this Council of Governments is concerned about the proposed project, that we believe delay in the start of the project is feasible and would allow time for the additional impact studies suggested in this letter, and that due consideration should be given to the long range economic impacts of the possible loss of tourism due to air, water and general environmental degradation of the entire Four Corners Region.

Sincerely,

William C. Wade
William C. Wade
Executive Director

MCW/JN:bp

CC: Ito Tachias
Everette Cooley
Jim Hoffman
Governor Raul Castro

IX-687

NEVADA POWER COMPANY
FOURTH STREET AND STEWART AVENUE
P.O. BOX 230 • LAS VEGAS, NEVADA • 89151

112

November 10, 1975

Mr. Paul L. Howard, Director
Utah State Office of
Bureau of Land Management
125 North State Street
Salt Lake City, Utah 84111

Re: Kalparowits Project Environmental
Impact Statement

Dear Mr. Howard:

Following the statement which I delivered at your hearings held in Las Vegas on September 18, 1975, re the subject project, you asked if we could furnish you with any studies either "in-house" or other studies that relate to the matter of restrictions in the corridor space between Glendale and Eldorado Valley.

I believe that the McDonnell-Douglas report "Electric Power Transmission Corridor Study, June, 1975" was mentioned at that time. While this report touched briefly on the relatively narrow corridor space, it does not detail particular requirements and constraints that I believe may be highlighted.

In addition to the McDonnell-Douglas study, we prepared "Nevada Power Company Report on Impact to Southern Nevada of the Kalparowits Project Transmission Lines" is included in your study and recommendations. The report includes the comments made as a result of additional discussions held with Southern California Edison Company and Nevada Power Company since the hearing date of September 18, 1975. The strip map included in this report shows the existing Navajo 500 kv line, the two Kalparowits Project 500 kv lines and the two Warner-Allen Project 500 kv lines.

Mr. Paul L. Howard
November 10, 1975
Page Two

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We appreciate the opportunity to furnish you this additional information for your consideration and study of the Kalparowits Project Environmental Impact.

Sincerely yours,

C. L. Ryan
C. L. Ryan
Executive Vice President

CLR:jw

cc: J. C. Gibbs
C. K. Grant
J. W. Arledge

E. I. Rowland
Nevada State Director
Bureau of Land Management
P. O. Box 430
Carson City, Nevada 89502

John S. Boyles
District Manager
Bureau of Land Management
P. O. Box 2400
Las Vegas, Nevada 89102

Richardson
Superintending Engineer of May Agent
Southern California Edison Co.
P. O. Box 510
Beach, California 90801

Public Service Commission
of Nevada
150 South
Carson City, Nevada 89501

IX-688

October 30, 1975

NEVADA POWER COMPANY
REPORT ON IMPACT TO SOUTHERN NEVADA
OF THE
KAIPAROWITS PROJECT TRANSMISSION LINES

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The Nevada Power Company has the responsibility of providing the citizens of Clark County with an adequate supply of electrical energy. More than 50% of the total State of Nevada population is in the Company's franchise area.

Along with this responsibility to serve goes the responsibility of planning for the future so that Southern Nevada will have an adequate supply of electrical energy to meet the needs of one of the nation's fastest growing areas. In meeting this obligation, the Nevada Power Company has started the Warner-Allen Power Project which is described in the Environmental Assessment report which has been distributed to the U. S. Bureau of Land Management, Utah State Office, and to other concerned parties.

A vital part of the Warner-Allen Project is the transmission system which will consist initially of one 500 kv line from Warner Station in Utah to McCullough Substation in Clark County, Nevada. The second stage of transmission will result in looping the Warner-McCullough line into Allen Station and building a second 500 kv line from Allen Station to McCullough Substation. Both of these 500 kv lines must follow the Navajo corridor located to the east of metropolitan Las Vegas and on the west side of the Lake Mead National Recreation Area.

Nevada Power Company recognizes that, although the EHV transmission line corridor was established from the Navajo Station at Page, Arizona through parts of Southern Utah and Northern Arizona and into Nevada, terminating at the McCullough Substation, that special consideration must be given to the addition of EHV transmission between Apex, Nevada and McCullough Substation. These special considerations are due to the unusual situation of having Nellis A.F.B., Lake Mead National Recreation Area, urban development in the Henderson area, natural formations such as Rainbow Gardens and Lava Butte and the Railroad Pass, which narrows the usable corridor. The attached strip map shows the restrictions imposed by these special considerations.

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Nevada Power Company, after careful study of this narrow corridor, believed, initially, that at least four more 500 kv lines could be accommodated without serious impediment to other possible future transmission lines required to service the Southern Nevada area or seriously increasing the environmental impact caused by the existing Navajo line which is in operation.

The Southern California Edison Company Kaiparowits transmission proposal showed two 500 kv lines on the east side of the existing Navajo line, and it is Nevada Power Company's intention to construct two 500 kv lines on the west side of the Navajo line.

Additional meetings with Southern California Edison Company have resulted in the relocation, eastwardly, of its two 500 kv lines to provide greater separation to permit construction of the Warner-Allen Project 500 kv lines and other additional lines required for Southern Nevada.

Nevada Power believes that the Southern California Edison Company revised plan as shown on the attached Nevada Power Company strip map is technically compatible with the Nevada Power Company plans, but we are concerned over the possibility that some group or agency would insist on limiting the number of lines through the corridor in question. It is, therefore, Nevada Power Company's position that if the number of lines were limited, Nevada Power Company's interests in serving Southern Nevada would be paramount and the preference for additional 500 kv lines through the corridor would go to the Harry Allen and Warner Valley Project lines and additional lines that are required to bring power and energy to Southern Nevada.

As indicated in Mr. C. L. Ryan's statement of September 18, 1975, at the Kaiparowits public hearings in Las Vegas, Nevada, Nevada Power Company has on file with the Public Service Commission of Nevada an application for construction of the initial Warner-McCullough 500 kv line. We expect an affirmative answer on our application in the near future.

689-X1



FRIENDS OF THE EARTH, INC. 154 COMMERCE STREET, SAN FRANCISCO, CALIFORNIA 94111

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November 13, 1975

Mr. Paul Howard
State Director
Bureau of Land Management
P. O. Box 11505
Salt Lake City, Utah 84111

Dear Mr. Howard:

Friends of the Earth presented condensed summaries of our initial analysis and position regarding the Kaiparowits draft EIS during public hearings held in Salt Lake City September 15.

The following comments are presented with the request they be considered in the planning process and included in the official hearing record.

Friends of the Earth is a national conservation organization committed to the preservation, restoration and rational use of the Earth.

A large amount of creditable data has been presented to date which casts grave doubts as to the desirability of the Kaiparowits project.

The approval of this proposal could initiate a transformation of one of America's last reservoirs of clean air, wilderness and natural beauty into a massive industrial complex.

The actual need for new generating capacity provided by the proposed Kaiparowits project is very questionable and not substantiated by information available to the public.

Developed alternatives to the proposed action were not discussed in a comprehensive manner nor developed systematically in a way which would outline the specific contours of each alternative. The alternatives discussed in the draft EIS do not provide the necessary information with which to evaluate their full environmental consequences.

Former Secretary of the Interior Rogers Morton rejected applications to build the Kaiparowits project in June, 1973, stating the plant "would impose severe additional impacts on this major recreation area." He further stated, "The scenic beauty of its rugged Southwest landscape, coupled with the clarity of the air in the vicinity, are national assets of major importance, worthy of protection for the enjoyment of future generations of Americans."

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Friends of the Earth supports the wisdom of this decision and urges the Secretary of the Interior to again deny applications to construct the Kaiparowits project.

The magnitude and complexity of the statement have made it difficult to review in the allotted public comment period. The initial request made by a number of conservation organizations for a 180 day review period would have afforded the proper public review of the proposal. The present short comment period has hindered public participation in the NEPA review process.

The January deadline established for completion of the final EIS does not allow members of the REM study team adequate time to analyze, evaluate, or incorporate independent research findings and individual statements submitted to the public record. The continued insistence of the Interior Department to quickly conclude an improper assessment and expedite a hasty departmental decision for the Kaiparowits project is a highly inappropriate procedure.

The Kaiparowits draft EIS does not fulfill the requirements necessary to adequately inform decision-makers how the project will affect the quality of the human environment. Although a tremendous amount of data is presented, a lack of relevant information exists in the document.

A number of subjects including those discussed in this statement need substantial improvement before the Congressional intent of the National Environmental Policy Act can be achieved. The draft EIS fails to inform the reader as to the exact nature of the proposal. A 3,000 megawatt plant is evaluated although the participants are quite willing to expand the plant to 6,000 megawatts in the near future. The participants have found a 25,000 megawatt facility could be built at the proposed site without significant danger of exceeding the limiting three-hour sulfur dioxide standards (VIII-221). Such a plant would be eight times larger than the one currently proposed. The Kaiparowits final EIS should inform the public as to the exact nature of the proposal.

Perhaps the most paramount consideration of the entire proposal is the relationship this project has to other energy developments planned for the region. At present, there are seven major coal-fired power plants operating in the Colorado Plateau region. Each of these plants has a planned operating capacity of at least 500 megawatts, five of them will operate at capacities over 1,000 megawatts. An additional seven plants with a combined capacity totaling 13,000 megawatts are currently under construction or planned for installation in the region before 1985.

Five of these plants, with a total of 9,430 megawatts planned capacity (Kaiparowits 3000 mg, I.P.P. 3000 mg, Garfield 2000 mg, Warner Valley 500 mg, Emery 930 mg) would be located within the midst of several nationally significant natural, scenic and recreational resources in

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southern Utah. The combined planned output of these plants would be four times greater than power production increases proposed for the same time in any nearby state.

Chairman of the Federal Power Commission, John N. Naiskas, estimated that a total of thirty-six more power plants might be needed in the Four Corner region in the next fifteen years.

What will be the cumulative effects of power developments to the Colorado Plateau region? The draft EIS states (I-345) "cumulative impacts, if any, will be specifically set out in subsequent parts of the statement." A subsequent part of the statement (VI-5) reveals the uncomfortable conclusion, "there is presently insufficient data for fully evaluating potential long-term cumulative effects of the current energy development scenario on air resources, visibility, and elemental buildup."

The draft EIS also informs the reader effects of existing power plants have yet to be determined, "data are not yet available to evaluate influence of the Navajo Power Plant on air quality in the Kaiparowits impact area (II-54)."

The Department of Interior has agreed that a decision can be made to halt power plant development when it is apparent the integrity of National Parks is threatened.

The National Park Service has stated in its Kaiparowits draft EIS comments, "Fossil fuels plants have already had an adverse impact on the air quality in the 4-Corners region. Existing and proposed sources of air quality impairment in the region threaten the integrity of many nationally significant resources including at least 20 units of the National Park System."

By endorsing a proposal-by-proposal approach to evaluating these massive projects, the Interior Department advocates a policy which would result in an adequate assessment of cumulative impacts only after all the projects are constructed and in operation. At that time, the integrity of the parks will have been sacrificed and discussion of suitable alternatives would be academic.

Accordingly, the Interior Department should prepare a comprehensive environmental impact statement to evaluate cumulative effects of the existing and proposed power developments within the Colorado Plateau. Such a regional EIS could determine how many, if any, power-related facilities should be allowed in the Colorado Plateau. In addition, the report could outline more suitable alternatives to the proposed nine-month electrical generating facilities.

The presence of the existing Southwest Regional Energy Study is persuasive evidence of the need for a suitable regional EIS.

The draft EIS presents information provided by the participants which states, "a 15 percent reserve margin could be maintained if Kaiparowits were delayed up to two years (VIII-369)." Quite probably, any delay necessary for completion and review of a suitable regional EIS would also have little effect upon such adequate reserves margins.

The decision regarding the Kaiparowits project should not be made until such a regional EIS is completed.

GENERAL EIS COMMENTS

The draft EIS is a product of a great deal of effort and presents a large amount of data in a fairly well organized manner. However, the document could be improved noticeably with the elimination of excessive repetition. Proper recombination of sections now scattered throughout the document would improve readability.

The lack of detail in Chapter VI, "The relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity," containing 18 pages, and the near absence of Chapter VII, "Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented," containing all of 6 pages, seriously question the validity of the report as a whole.

The draft EIS contains far too many inadequacies, omissions, contradictions and unknowns for such a proposal as this. Statements repeated throughout the document, "impact is not well defined . . . a relationship can only be predicted with recognized uncertainties . . . there are presently insufficient data," exemplify the fact that examination and objective evaluation of the proposal is currently impossible.

The draft EIS should not so blatantly dismiss the widespread opposition to this project by large numbers of people. "A small coalition of resident and non-resident conservationists would be disappointed if the project were approved (III-11). Should this statement appear in the final EIS, something appropriate should follow: "However, a such smaller coalition of resident and non-resident corporate executives, federal administrators, and Utah politicians would be disappointed to a lesser extent if the project were not approved."

ELECTRICAL DEMAND FORECASTS AND ALTERNATIVES

The decision to construct the proposed Kaiparovits power project stems from certain assumptions about future demand for electricity made by the three participating utilities, Southern California Edison Co. (SCE), San Diego Gas and Electric Co. (SDG&E), and Arizona Public Service Co. (APS). These assumptions were manifested as forecasts of future electrical demand presented by the three utilities in the draft EIS. Specifically, SCE predicts a 4.6% average annual compound growth rate in peak demand in its market area during the period 1975-1985, SDG&E predicts a rate of 7.4%, and APS predicts a rate of 8.3%, yielding an aggregate rate of demand growth of 6.8%.¹ There is no justification presented in the EIS for this growth in demand. Per capita use of electrical energy is also predicted to grow in the future, but no rational at all is presented in the EIS explaining these continued growth rates in lieu of evidence accumulating to the contrary.²

A delineation of exactly how every additional kilowatt-hour will be used would be appropriate, but the EIS should contain at least an explanation of the forecasting methodologies employed by the participating utilities. Robert Beck and Henry Myers of the Federal Energy Administration (FEA), referring to the proposed Kaiparovits project, conclude: "These projections which have been made either are insufficiently detailed or rest on assumptions considered too speculative as a basis for planning."³ The presentation of forecasting methodology in the draft EIS, in conjunction with appropriate data would allow interested parties to arrive at their own conclusions regarding the need for increased electrical generating capacity. Beck and Myers further conclude that: "Recognizing that demand forecasts must necessarily reflect many subjective judgments, the FEA believes it important that there be forecasts compiled independently of those produced within the electric utility industry."⁴ Such an independent forecast is absent from the draft EIS and should be included in the final EIS.

The age of rapid growth in electrical capacity is over. The 6.8% demand growth rate predicted by the participating utilities for 1975-1985 implies a doubling of electrical capacity in the next 11 years. It is apparent from present difficulties in power plant siting that this doubling in capacity can't be achieved in the next decade. It is most certain that it would be impossible to construct four times the utilities' present capacity by 1997 as would be necessitated by the continuance of this growth rate.

The ratio of the number of employees per dollar of investment is the smallest of all industries for electric utilities.⁵ Construction of large amounts of new generating capacity would therefore aggravate an already inflated unemployment situation. We are now entering an era of history when investment in conservation is more beneficial to society than construction of new generating capacity. Studies have shown where it is less costly to save a kilowatt than to construct a kilowatt of new capacity.⁶ Conservation as an alternative to the proposed Kaiparovits power project unfortunately receives inadequate treatment in the draft EIS.

At the present time, 40% of the output of the proposed project is committed to the Southern California Edison Co. (SCE). This represents the largest share of the participating utilities. SCE also happens to employ a rigorous forecasting methodology in determining demand.⁷ The methodologies employed by the other participating utilities are inferior to that employed by SCE. For this reason and because SCE would allegedly distribute the largest share of the output of the proposed project, the SCE forecasting methodology will serve for a case study to determine the relevance and quality of demand prediction by a participating utility. The general conclusions gleaned from this case study apply equally to the other participating utilities.

Due to the fact that SCE forecasting methodology was not presented in the draft EIS, the methodology or model that will be criticized is that which was submitted to the California Energy Resources Conservation and Development Commission on June 13, 1975, by SCE in accordance with the Warren-Alquist Act. The SCE market area is located in southern California and is composed of the sprawl surrounding Los Angeles and a number of rural counties on the periphery of the Los Angeles region. In 1975, end use of SCE kilowatt-hour sales will breakdown as follows: residential sector—25.4%, commercial—24.6%, and industrial—32.0%.⁸ Other uses making up the balance of sales include agricultural, sales to public authorities, and resales to other utilities, and are not significant with respect to total future sales. The following section will therefore discuss the SCE models for predicting future electrical demand in the residential, commercial, and industrial sectors.

The residential demand model derives electricity usage for the sector as a function of population, population-customer ratio, and economic indicators. Prediction based on this model is only as correct as the prediction of the various parameters. As we shall see, there is very good reason to question the validity of at least the population projections developed by SCE. Economic variables are increasingly difficult to predict, as our economy experiences baffling, novel behavior. This residential model fails to take into account the energy savings due to the trend towards multiple family dwelling which is expected in the SCE market area. Multiple family housing units use less electricity than the single family units which now dominate the market area.⁹

The commercial demand model derives electricity usage for the sector as a function of the number of residential customers and a number of economic indicators: gross state product, real disposable personal income, and total employment. The model therefore depends on the same population projection that yields the number of residential customers.

The industrial demand model derives electricity usage as a linear function of the gross state product. The evidence shows, however, that we can expect industrial energy usage to grow more slowly in the future relative to gross state product due to the fact that energy per dollar of value added has declined in the industrial sector and is projected to decline at an even greater rate in the future.¹⁰

The SCE model attempts to account for the effects of conservation of electricity. SCE assumes that conservation effects are captured by price elasticity effects. This elasticity effect is used in conjunction with a prediction of electricity prices to adjust the base forecasts previously described.¹¹ This method appears to be technically incorrect for a number of reasons.¹² First of all, SCE assumes electricity prices will decline, relative to other prices, in the next ten years, which is a highly controversial assumption.¹³ Second, price is not an exogenous variable. Price is the simultaneous solution of supply and demand equations.¹⁴ Third, SCE does not distinguish between the effects of mandatory conservation and price effects. The price of electricity affects only the quantity demanded, while conservation efforts tend to affect both the price and the quantity demanded.¹⁵ This reflects again on the necessity of simultaneous supply and demand equations to predict demand. Fourth, the SCE model, by assuming that conservation is captured in price elasticity effects, simply fails to account for the effect of mandatory or voluntary conservation efforts other than those which are economically motivated. In doing so, SCE seems to ignore the mandate of the Warren-Alquist Act of the state of California (AB 1575) which requires reduction in the electricity usage growth rate by regulation.

Evaluation of SCE forecasting methods points to four conclusions. First, the commercial and residential models are sensitive to population projections. Second, the industrial model does not capture the shift away from energy-intensiveness that is documented for that sector. Third, the attempt to include conservation effects in the model fails. Conspicuous in its absence from the model is the fourth point, which is the amount of electrical demand that will be offset by the implementation of solar heating and cooling devices in the market area.

Population projections are used as variables in demand models accounting for 50% of SCE electric sales. Proper documentation of these projections is absent from the draft EIS and there is good reason to question the 1.7% projection presented.¹⁶ The absence of a well specified model prevents interested parties from duplicating these projections and examining the methodology.

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SCE's projections of the future population of Ventura and San Bernardino counties are the only projections suitable for comparison with projections by other agencies due to the non-correspondence of other counties to the SCE market area boundaries (SCE projects for only that fraction of a county that it serves). The California Department of Finance (DOF) population projections, which are used as a planning tool in the region, serve for comparison. For the Ventura County population in 1990, the DOF projection, assuming a migration rate of 100,000 persons into the state per year and a high birth rate of 2.5, yields a smaller population than the SCE projection which also assumes a migration rate of 100,000, but assumes a lower birth rate of 2.1.¹⁷ Similarly, in constructing San Bernardino County projections for 1990, DOF and SCE both assume a migration rate of 100,000, DOF assumes a larger birth rate of 2.5, SCE assumes a replacement rate of 2.1, and yet the SCE projects a larger population than DOF.¹⁸ Both of these comparisons yield results contrary to what we expect under this set of assumptions. The only apparent explanation for this discrepancy must be differing assumptions about population distribution within the State of California. The implications of this discrepancy in population projections is an increased future demand for electricity as projected by SCE. The particulars of SCE's population projections should be clearly presented to the public in order that they may judge the quality of SCE's demand predictions.

Conservation is the basic short term alternative to the proposed Kaiparowits project. Long term alternatives involve the shifting of our energy sources from the depletable, "dirty" fossil fuels that we now burn to less polluting, renewable sources. Such mid and long term alternatives include solar energy, heating and cooling applications and solar electric generating plants, wind energy, and geothermal energy. Coupled with conservation and the exploitation of renewable sources should be a decentralization of our electric generation facilities. As a short term alternative, conservation is inadequately dealt with in the draft EIS.

The SCE demand model has been shown to fail to adequately incorporate conservation effects into its forecast. Specifically, items missing or poorly treated include the impact of the Warren-Alquist Act on the market area, the price effects on demand, and institutional and technological innovation in the field of energy conservation.

The Warren-Alquist State Energy Resources Conservation and Development Act (AB 1575) is designed to decrease the electrical growth rate in California. Section 25402 (a-d) describes procedures created to conserve electricity. Regulations including mandatory building design and construction standards to increase energy efficiency and minimum levels of appliance efficiency for items sold in the state will be promulgated. This is exactly the kind of conservation activity which is not considered by SCE forecasting methodology.

SCE has made the assumption that electricity prices will decline relatively in the near future. Economically motivated conservation is very unlikely

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under that assumption. On the other hand, what would be the effects of rising electricity prices, which is more probable?¹⁹ In the short term, users would be burdened with their electricity consuming stocks and would simply reduce their frequency and extent of use. In the long term, however, users would replace their electricity consuming stocks with more efficient or non-electric items.²⁰ Firms would seek to reduce their use of electricity relative to other inputs and the energy use per dollar value added in the industrial sector would decrease. Generally there would be a shift away from energy intensive industries. These changes in demand for electricity are ignored by the SCE assumption of declining future prices for electricity.

There are a number of institutional changes which could curtail growth in the use of electricity in the market area. Referring to the proposed Kaiparowits project a FEA study states: "For example, financial incentives and disincentives combined with regulations concerning electric power use could limit electric power demand to the point where new generating capacity would not be required."²¹ Peak power pricing is one such incentive. By increasing the price of electricity usage during periods of peak demand, electricity use would be more uniformly distributed throughout the day. This would result in an increased load factor (the percentage of generating capacity in operation at a given time) for the utility, thereby deferring the need for new capacity into the future. Another such incentive is the abolition of the declining block pricing system. Replacing this subsidy with a price structure that reflected the true marginal cost of producing electricity would go a long way towards solving the electrical growth problem in the market area. The effects described as responses to electricity price increases in the industrial sector would be greatly accelerated if the artificiality of declining block pricing was removed.

There are two innovations concerning the connections between utility networks that would serve to reduce the amount of capacity required to meet demand. California experiences a peak in demand for electricity during the summer, while the Pacific Northwest is a winter peaking system. An expansion of the intertie between California and Pacific Northwest utilities would increase the load factor of both systems, thereby deferring the need for increased capacity.²² Second, increased cooperation between California's utilities could serve to increase their load factors. This is due to the fact that the sum of the individual utilities' non-coincident peaks has averaged 4% greater than the statewide coincident peak.²³

The application of technology to the conservation of electricity will produce profound savings in the use of electricity.²⁴ More stringent insulation standards will shave the demand for heating and cooling. Increasing the efficiency of appliances will substantially reduce demand, especially for refrigerators and air conditioners. We shall see the implementation of these methods in the near future due to the mandate legislated by the Warren-Alquist Act. Other methods of reducing demand include increased usage of fluorescent lighting which uses four times less

energy than incandescent lighting.²⁵ Coupled with this shift is the reduction of lighting to necessary levels. Energy efficient architectural design would go far in reducing electricity demand and could avoid such technological boondoggles as the juxtaposition of heaters (lighting) and air conditioners in sealed office buildings.

Dr. Ron Doctor has developed what SCE has failed to accomplish to date: "a forecast that explicitly includes the effects of rising energy prices and conservation activities likely to be implemented . . ."²⁶ (pursuant to AB 1575). The results of this model applied to the SCE market area predict a demand of 2440 megawatts less than the SCE prediction for the year 1984.²⁷ This is equivalent to displacing twice SCE's share of the power from the proposed Kaiparowits project.

SCE assumes that solar heating devices will not become economically competitive before 1985.²⁸ Quite to the contrary, the FEA explains that "recent analyses by several industrial firms have shown solar heating and cooling systems to be competitive where there is high insulation and where the costs of conventional fuels are also high."²⁹ The applications of solar heating and cooling include between 25% and 33% of all U.S. energy use, according to the FEA report. Estimates of the national impacts of these devices on total energy demand in the year 1985 based on pre-embargo data range from 0.75% to 2.0%. In 1990 this impact could range from 1.25% to 4.15%.³⁰ This estimate is extremely conservative due to post-embargo conditions. Clearly, these devices will impact the SCE market area during the time period of concern, further reducing the demand for electricity.

Forecasts of demand for electricity are at best a tenuous, subjective determination. SCE 1972 projections for 1974 were 18% higher than actual consumption.³¹ Ten year projections were scaled down 19% by SCE after the oil embargo.³² At worst, forecasts of demand for electricity are self fulfilling prophecies. As is stated in the draft EIS: "In a very real sense, demand forecasts are important determinants of actual consumption, rather than the other way around." The justification that is presented is "if demand is overestimated and increased electricity is available for consumption, utilities may curtail conservation efforts and thereby stimulate demand to the anticipated levels."³³

Consideration of the impacts of the proposed project on the market area of Southern California highlights the cyclical nature of the utilities' prophecies. The draft EIS states: "Since electricity is required for urban growth, there is no question increased availability of electricity would influence patterns and intensity of population growth."³⁴ This increased population, presumably due to migration, would in turn require increasing amounts of electricity, according to SCE, due to growth in per capita use. This in turn would be cause for the construction of new generating capacity, which would facilitate urban growth and continue the cycle. On the other hand, without an increase in generating capacity, growth can not occur once the utilities reach their capacity.³⁵ As communities in the service area grope for legal methods of growth control, perhaps they should consider a moratorium on growth in electricity generating capacity.

TABLE 4*

Customer Class	Model	Customer Class	Model
Model Specification & Method of Estimation: Residential Customer Sales	Model specification: 1. $RCUSr = PCPr/PCR$ 2. $ARUr = ARUr - 1 =$ $a + b (CSPPr - 1 - L - PDPPr - 2)$ $c (TPr + TPr - 1)$ 3. $TRUr = RCUSr \times ARUr$ Method of estimation: regression.	Model Specification & Method of Estimation (Contd.) Commercial	Model specification: 1. $CCUSr = i(RCUSr)$ 2. $ACUr = ACUr - 1 =$ $a + b (CSPPr - 1 - CSPPr - 2)$ $+ c (RDPPr - 1 - PDPPr - 2)$ $+ d (TPr + TPr - 1)$ 3. $TCUr = CCUSr \times ACUr$ Method of estimation: factor analysis.
Industrial	Model specification: $TISr - TISr - 1 =$ $a + b (CSPPr - CSPPr - 1)$	Other Public Authority	$OPAr = a + b TRUr$ Method of estimation: regression
Retail	$Resale =$ $a + b (TRUr + TCUr + TIUr)$ Method of estimation: regression.	Conservation Effects	No explicit conservation measures listed; overall effects assumed captured in a conservation and price model.

* For a complete list of symbol definitions, see Table 1.

Source: An Independent Staff Analysis of the California PUC
Report on 10 Year Forecasts of Electric Utilities*
Loads and Resources

Providing more electricity to Southern California will certainly not have pleasant impacts. According to the draft EIS we can expect a loss of open space, increased air pollution, increased traffic, and rapidly disappearing open space, and congested traffic problems. It is time that we face up to the deterioration of urban areas where almost all Americans live. As is stated in the draft EIS: "Adequate energy supplies would likely facilitate urban growth and spread in the market impact area, and income increases."³⁶

The assumptions underlying the participating utilities forecasts is the belief that they can foster large compound growth rates in sales into the future. Evidence is now accumulating to the contrary. In 1974, for example, the electric utility industry's sales were 1.5% below the 1973 level, and in 1975 they were 1.5% below the 1974 level. This decline was due to a 2.5% reduction in peak demand and a 5.6% reduction in energy use.³⁷

It has been stated that "Energy demand functions are evolutionary variables which change slowly over time. The demand functions for electricity are not changed."³⁸ It is time that the utilities planning to impose the proposed Kaiparowits power project on the American people at the expense of the unique environment of southeast Utah looked to these changing factors.

We have presented evidence that has shown exactly how SCR's demand predictions are inflated. We have shown how conservation load factor innovations, and the impact of solar heating and cooling devices will further reduce demand. The results of Dr. Ron Doctor's demand model show that the demand for the power from the proposed project will be deferred far into the future. An examination of the changing factors which determine demand shows that the demand for power from the proposed project is no longer valid. There is no need for the new generating capacity of the proposed Kaiparowits power project.

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RCUS = number of residential customers
 POP = population/LGPOP=log of population
 PCR = population - customer ratio
 ARU = average annual usage per residential customer
 RDPI = real disposable personal income
 LCPI = log of real disposable personal income
 TE = total employment
 TRU = total residential usage
 CCUS = number of commercial customers
 ACU = average annual usage per commercial customer
 TCU = total commercial usage
 GNP = gross national product
 GSP = gross state product
 TIU = total industrial usage
 OPA = other public authority sales
 RESALE = resales to other utility companies

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AIR QUALITY

The clean air of the Kaiparowits region is a resource in scarce supply. Visibility averages approximately 70 miles and on an exceptionally clear day the visibility ranges up to 150 miles. Continued maintenance and future protection of this valuable air shed is in the best interests of the nation.

A recent Federal Energy Administration poll revealed that 94% of the Americans surveyed felt that areas which have clean air "should be kept as clean as they are now." The maintenance of clean air in the Kaiparowits region is of particular importance due to its outstanding scenic, recreational, aesthetic, historic, and geological resources. One-fifth of all the lands managed by the National Park Service are within 250 miles of the proposed plant site. The magnificent vistas indigenous to the region are an essential factor in the enjoyment which millions of visitors experience every year. The Clean Air Act and its interpretation by the courts indicate that this area, with the largest concentration of National Parks in the country, should be afforded the vigilant protection possible. We should not now despoil the air quality of National Parks and other areas of national significance. Future generations would be denied the opportunities these resources now provide.

It seems that large amounts of information in the air quality section of the draft EIS were supplied by the participants of the proposed project. The participants have a self-serving interest in only providing information which would be beneficial to their proposal. One would not expect them to present any data which would jeopardize approval of the project. This was apparent while reviewing the document.

Air quality impacts presented were based upon four predictive models. These models obtained results by use of plume simulation tracer studies. The use of such fluorescent tracers in planning for the Navajo Power Plant provided results that were in error by a factor of 15.

It is interesting to note that in the draft EIS only the results of the Intercomp model are given. It is not until the errata sheet of Chapter 3 that results from any other models are given. Here the WQMA model presents predicted results for ground level SO₂ concentrations 5 to 20 times higher than those calculated by the Intercomp model. Yet, according to the errata sheet, these higher levels, "are still within both the ambient air quality standards and the significant deterioration regulation limitations." However, the data given only predicts SO₂ concentrations on a one and three hour basis. According to the Denver EPA regional office, calculations of 24-hour concentrations based on the WQMA model predictions indicate that SO₂ levels at the south end of the Kaiparowits plateau will violate the Class II limitation.

The information on the errata sheet for Chapter 3 only considers possible Class II violations. The errata sheet for Chapter 1 states, "the probability exists that the plume from the proposed project would violate the

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Class I limitations of these areas." These areas are National Parks in close proximity to the proposed plant site. Calculations done by Dr. Michael Williams indicate that SO₂ concentrations in Bryce Canyon National Park would be expected to exceed Class I increments. There is a good chance that the National Parks in the region will be reclassified Class I. The final EIS should discuss the implications of reclassification as it concerns the significant deterioration of regional air quality.

According to information on II-56, "limited dispersion conditions often associated with regional stagnation and buildup of air pollution levels can be expected between 2-4 times per winter, with an average duration of five to seven days. During these episodes emissions would likely be confined to the Lake Powell basin." What would happen under these meteorological conditions with Navajo and Kaiparowits pouring thousands of tons of pollutants into the same limited volume of air? The draft EIS answer is found on II-54. "Data is not yet available to evaluate influence of the Navajo power plant on air quality in the Kaiparowits impact area."

Plume interaction of Navajo and Kaiparowits and their combined synergistic effects could seriously jeopardize the environment of the Lake Powell basin. Potential health hazards, reduced productivity, and degradation of air quality should be better understood so that a meaningful review of the air quality problems can be made.

This and all other air quality assessments should be presented in an objective manner in the final EIS by parties not directly involved in the project. This will help to insure against a conflict of interest which is now apparent in the draft EIS.

The draft EIS makes persistent mention that mitigating pollution control equipment will reduce emissions by 99.5% (by-weight) for particulates and 90% (by-weight) for SO₂. This assumes that the emission control equipment will function at maximum rated efficiency. Unfortunately, these systems can only function at these "designed efficiencies" for brief periods of time under ideal conditions. Experience shows that over the long-term, systems designed at 99.5% capacity will only operate at approximately 97%. As examples, the enclosed list of precipitators describes 15 units and their design efficiencies together with present estimated actual performance in the TVA system. As the table indicates, only two of the 15 are meeting design efficiency.

The reduction in operating efficiency of approximately 2.5%, while seemingly small, will actually increase particulate emissions six-fold. This would increase the estimated 12 tons of daily particulate emissions to approximately 72 tons.

The draft EIS has not considered the probability of emission control equipment working at less than design efficiency except to briefly evaluate a total equipment failure. The final EIS should consider a range of operating efficiencies and their varied impacts.

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While the participants have committed themselves to achieving 99.5% and 90% efficiencies, there is no guarantee that they will be able to meet these figures. Page IV-1 of the draft EIS states "It is assumed the participants would act in good faith in carrying out the mitigating actions to which they have committed themselves in writing." It is interesting to note that the federal water contract only makes it necessary for the participants to remove no less than 97% of particulate matter from stack emissions in each month and not less than 96% in any 24-hour period. One method of assuring that the participants comply with their written commitments is to require a surety of performance bond. This could be accomplished separately or as an amendment to the federal water contract.

The existing Navajo plant has often produced a conspicuous brown haze throughout the Lake Powell region. Will Kaiparowits add to this problem? More than once in the draft EIS (III-38, II-14) it is stated, "studies by the Bechtel Power Corporation (1974) have indicated that brown discoloration would not be noticeable unless the observer was looking along the plume axis." However, the next sentence on page III-38 states, "experience to be gained with observations at Navajo will be valuable in further assessing this problem." The problem is assessed and spelled out on V-14. "The plume at Navajo is quite noticeable at any angle." It would seem reasonable to assume that the Bechtel studies were based on highly questionable parameters. An independent analysis of this problem should be included in the final EIS.

The draft EIS states (V-52), "scientific studies indicate that most of the visible particulates and gasses emitted from the plant would be controlled. However, actual observations of plants with similar air pollution control equipment indicate that stack emissions are visible and could create a sky or haze discoloration problem."

The emission control equipment will remove much of the visible particulates, yet it is the invisible micron and sub-micron particles not controlled by the precipitators which pose the greatest threat to public health and welfare. These uncontrolled particulates include toxic trace elements, nitrates, and sulphates.

In a recent study, two Canadian lakes were slowly acidified and their fish populations eradicated from airborne sulphate emissions originating at a source 100 miles away (draft EIS comments submitted by the U.S. Department of Fish and Wildlife). High sulphate concentrations are known to cause dramatic rises in respiratory ailments.

Are we to believe "scientific studies" or "actual observations" in assessing the effects of stack emissions on the Glen Canyon National Recreation Area and nearby National Parks? The draft EIS contains far too many "unknowns" and "incompletes" to properly consider the true adverse impacts of the project. The large gaps in essential data make a balanced decision impossible.

CLIMATE

The draft EIS states, "no significant effects on regional climate could be expected" if the proposed action were implemented (III-13). This statement has little, if any, credibility. The National Oceanic and Atmospheric Administration (NOAA) is currently conducting studies in the Four Corners area in order to gain the necessary information with which to determine the effects of large scale coal related energy development on regional climate. A NOAA spokesperson has said, "it is reasonable to assume that there is as yet insufficient data to assess the long-term meteorological consequences of coal development." This discrepancy should be corrected in the final EIS.

TRACE ELEMENTS

Large scale coal-fired power plants emit quantities of trace elements which are known to be hazardous to all biological species. The extent to which these elements enter the ecosystems is not well documented. However, a lack of documentation should not be assumed to correlate with a lack of significance.

The Kaiparowits draft EIS recognizes the three main sources of trace element contamination related to the project: generating station stack emissions, tailings pond discharge, and leaching from ash and solid disposal areas. In the draft EIS, the impact of trace elements from these sources is related to air, water, soil, vegetation and wildlife. Although these problems are outlined, lack of data is often cited as a reason to treat trace elements as an incidental problem which should be monitored. Evidence from past developments indicates that trace element toxicity could be a problem of great enough magnitude to seriously effect the health of plants, animals, and man in the entire area. Therefore, more serious consideration should be given to dealing with harmful contamination.

Toxic trace elements, including mercury, arsenic, fluorine, beryllium, cadmium, lead, molybdenum, selenium, et. al., which are in the Kaiparowits coal would be released from the coal during combustion. Volatile trace elements, fluorine, arsenic, mercury and molybdenum are emitted from the stack in the form of particulates less than two microns in diameter.

Several points should be made about the problems resulting from these particulates smaller than two microns which would escape the precipitator and scrubber.

Stationary fuel combustion already contributes 8.1×10^6 metric tons or approximately half of the particulates emitted annually in the U.S.¹ Particulates interfere with terrestrial infrared radiation, scatter solar radiation back into space, and reduce visibility. These meteorological, geophysical, and climatic changes affect the entire globe. A marked reduction of visibility which is associated with these more serious

changes has already been observed in the Four Corners area since the completion of several coal-fired power plants in that area.² The draft EIS clearly indicates that the Kaiparowits project would further this degradation of visibility.

Particulates and gasses may undergo or act as catalysts for a variety of reactions which transform these substances into more toxic secondary pollutants. "This is particularly true in the case of photochemical smog. Pollutant concentrations are directly related to the density of industry and the use of fossil fuels for power and space heating."³

The size of particulates is extremely important. Fifty to eighty percent of particulates smaller than one micron are absorbed into the blood stream from the lungs. Larger particulates are trapped by the respiratory system and directed to the stomach where the absorption rate is only five to fifteen percent.

The 12.5 tons of particulates emitted daily from the proposed Kaiparowits project under ideal conditions would indeed be of a very toxic nature due to the small size of the particulates. The draft EIS does not qualitatively describe the 12.5 tons of particulates and the extent to which these elements could affect the area. A closer look at some of the elements contained in the emission is helpful in assessing the magnitude of the problem.

During combustion, approximately half the fluoride in coal is emitted as gaseous hydrogen fluoride, silicon tetrafluoride, and particulate matter. From the total of 402.3 million tons of coal burned in the United States in 1968, for steam and energy production, fluoride emissions to the atmosphere have been estimated at 16,000 tons.⁴ In a study of the effects of fluorides on plants, McCune and Weinstein state that hydrogen fluoride or silicon tetra-fluoride are among the most toxic of all pollutants important to agriculture. Food chain concentration of fluorides has already been observed to affect cattle. Fluoride ingestion can cause osseous lesions, lameness, appetite impairment, decrease in weight gain or diminished milk yield. Although the Kaiparowits project would not be located in an agricultural area, excessive amounts of these elements are known to be detrimental to other mammals.

In a review of the toxic effects of cadmium, Flick et. al. document that the incidence of cadmosis is closely associated with an increase in industrial use of fossil fuels to produce metals. Diseases associated with cadmium ingestion are arteriosclerosis, cancers, renal dysfunction, hypertension, growth inhibition, and hemorrhagic lesions in the sensory ganglia. The majority of these cases result from long-term exposure to cadmium rather than from a short-term acute exposure. The introduction of cadmium from the Kaiparowits project could create a long-term increased exposure situation in the region.

Mercury is another volatile trace element which is known to concentrate in fish and to be harmful to both plants and animals. The draft EIS

deals with mercury and goes so far as to suggest that fishing habits of those fishing in Lake Powell could have to be altered because some species would be unfit for human consumption. Effects of toxic trace elements upon terrestrial wildlife habitat are not discussed in any detail except to state, "effects of long-term plant and animal exposure to low levels of some pollutants is not known (III-153)."

Radioactive emissions are not dealt with qualitatively: a listing of radioactive elements in the coal (radium-228, thorium-232, radium-226, and thorium-230) is made and a total radioactivity concentration of 0.77pCi/g is listed. The hazard associated with these elements and the half lives of the isotopes are not mentioned. Instead it is stated that "no measurements are being made of atmospheric radioactivity in the Page or Lake Powell areas (III-39)." The long-term genetic changes that could be induced by these elements should not be overlooked.

Some additional large problems are not addressed in the draft EIS in depth. Climatic changes, damage incurred from breathing poor quality air, biological changes in plants in areas affected by the emissions, and the problems of washout are not discussed in the draft EIS. The document repeatedly claims, perhaps mistakenly, the emissions controls will meet current regulations and no additional action need be anticipated to deal with trace element contamination.

The solid disposal from the project would include bottom ash, fly ash, scrubber sludge and other wastes. These materials contain concentrations of trace elements far higher than those found naturally in soils. The draft EIS (III 112-123) states that leaching of the ash disposal into Lake Powell would occur as rain moves down through the disposal material to a mudstone shelf which would induce lateral movement of the salty, trace element contaminated water to seep out of canyon walls. Estimates of the quantity of contamination are not thorough.

Reclamation efforts include the plan to put one foot of soil over the solid disposal, followed by seeding. The establishment of vegetation and prevention of leaching and erosion is highly questioned (III 72-74). It appears that the slope of the disposal area would be highly conducive to erosion and would eventually result in considerable long-term trace element contamination of the reservoir. "Transport of fly ash-scrubber residue and trace elements to Lake Powell would continue for a number of years after abandonment of the facility as would any detrimental effects they have on aquatic life and water quality." (p. 111-74)

The tailings would contain concentrations of certain trace elements in excess of natural conditions by a difference of several hundred fold. Arsenic, fluorine, boron, nickel, and chromium are mentioned in the draft EIS; however, lead, cadmium, beryllium and most of the other trace elements in coal would also be in the tailings. The fate of these elements is ambiguous. Some amount would be absorbed by fine grained shale and mudstone while the remaining portion would eventually enter water systems.

Coal contains variable concentrations of trace elements which are known to be harmful to man. Disturbance of soil, mining of coal, and the combustion process introduces these elements into ecosystems.

The draft EIS assumes current measurements of trace elements are adequate. Current measurements are inadequate and the effects on the entire ecosystem and ultimate effects on man must be integrated.

Overall, the passive attitude of measuring trace element increases does nothing to prevent or solve the long-term cumulative problems. The draft EIS states that a problem is the long-term cumulative effects of trace elements carried by fly ash and deposited on soil, water and vegetation. However, the draft EIS apparently proposes that this be accepted. Fig. 19, (III-79) estimates the current soil trace element levels, pounds of trace element emitted, 35 year and 50 year cumulative effect. The treatment of these increases in trace elements is characteristic of the attitude exemplified by the following statement, "Impacts are not fully predictable, but the toxic nature of some trace elements may be detrimental to future use of the area by plants and animals and, perhaps, man (III-78)."

WATER RESOURCES

Surface Water

The use of water is one of the most critical resource decisions to be made in the development of energy resources in the arid and semi-arid West. It is apparent that water availability will be a limiting factor in the growth and development of the Colorado River Basin and, therefore, decisions as to the use of water must be made with a view towards the long-range benefit of the region.

Existing and planned energy developments in the region threaten to preempt all other water uses. In fact, this condition may exist in the very near future. Roland Robinson, Deputy Assistant Secretary of the Interior, had this to say, "the [Colorado] river is already overappropriated and has serious water quality problems almost throughout the basin." If overappropriation is a fact of life, then federal, state, and private authorities should set priorities for future use. The multiple uses of the river must not be sacrificed for the dubious benefits of more power production.

Over-appropriation resulting from the project would specifically conflict with existing water rights. The 2,000 gallons of water per day needed for operation of the limestone quarry will come from already existing water rights in the Sevier River drainage (111-132). The preferred, anticipated water source for the new town would be ground water from deep wells. Withdrawal of the 5,900 acre-feet per year for the new town would lower existing water levels in existing nearby wells (111-117). There is no suggestion in the draft EIS that this water be taken from the proponents allocation from Lake Powell. While the existing water contracts may be a constraint, the alteration of them might prevent the possibility of long-term litigation eluded to on page 111-128.

In the case of Kaiparowits, the issue is the use of Utah's allocation of Colorado River water stored in a Federal water project, the Lake Powell reservoir. Resources Inc. has obtained a water permit, #35818, dated September 3, 1965, from the State of Utah for graduated amounts of water reaching 102,000 acre-feet (AF) a year for the period 1969-2011. After this time the allocation will decrease until 2031 when it will be phased out if there is demand for the water elsewhere.¹ Utah's right to the water stems from the Colorado River Compact of 1922, an Upper Basin Compact of 1948, and the Colorado River Storage Project Act of 1956.² The issue of the ownership of Lake Powell reservoir water is murky at this point, but Resources Inc. circumvented any jurisdictional complications by negotiating a contract dated October 2, 1969, with the Department of Interior, Bureau of Reclamation for delivery of Lake Powell reservoir water.³ Additionally, Resources Inc. circumvented further complications by negotiating a contract with the Indians of the area, preempting claims they might make on the water.⁴

The body of law pertaining to the Colorado River appears to limit the allocation of each state's portion of the water to the state itself.⁵ The issue of alternative uses of Resources Inc.'s water is therefore limited to the State of Utah, notwithstanding contrary ruling. Resources Inc.'s water agreement with the state is conditional to electrical generation⁶ and the freeing of this water for alternative uses would require renegotiation with the State of Utah.

The Upper Colorado River basin agreements allocate Utah 1.714 million acre-feet (MAF) per year. This is based on an allocation of 7.5 MAF per year to the Upper Basin, a legal figure but apparently not a realistic one. A Department of Interior working figure for water in the Upper Basin, based on a series of assumptions, is 5.8 MAF.⁸ Utah's share would then be 1.322 MAF.⁹ The estimated 1974 depletions for the state total 825,000 AF.¹⁰ Under these conditions, Resources Inc.'s 102,000 AF represents about 20% of Utah's unused allocation. Engineering estimates predict that at most 50,000 AF will be used yearly.¹¹

This represents about 9% of Utah's unused allocation. These figures present the magnitude of the water use decisions under consideration and differ greatly with those presented in the draft EIS.

An estimate of future water use in Utah based on an allocation of 1.322 MAF reveals that Utah will be using all its water shortly after 1990.¹² Since water rights are transferable property rights in Utah,¹³ it can be expected that high value users of water will bid rights away from low value users. Since the production of energy represents a dollar value of a much greater magnitude than agriculture in the region for a given quantity of water,¹⁴ it seems reasonable that in the absence of institutional constraints, water use will be bid away from agriculture into energy use. The Department of the Interior stated on April 24, 1975, that energy will not be given priority for water use over agriculture.¹⁵ Furthermore, Article III, Paragraph (c) of the Colorado River Compact states that agricultural and domestic uses of water shall have preference over use for power generation.¹⁶ This does not seem to be the policy which is developing. Power plant development is getting preference over all other uses. The implications of this are staggering. Not only does the consumptive use of water for power production prohibit agricultural uses, the impacts of increased energy supplies have grave ramifications for agricultural lands in the market area.

In 1974, irrigation represented almost 65% of the total water depletion for the State of Utah.¹⁹ It has been shown elsewhere that urbanization and changing land values are also causing a phasing out of agriculture.¹⁹ Between 1964-1969, Orange and San Diego Counties, direct recipients of the proposed project's electricity, suffered respective losses of 24.3% and 11.5% of their farmlands. Electricity is required for urban growth, and according to the draft EIS, "any increase in available electricity will facilitate that growth (111-299)." The trend towards reduction

of agricultural lands in this area will continue as the supply of electrical energy increases. This is ironic in times of world wide food shortages, widespread malnutrition, and massive starvation.

Within the realm of energy production itself, it is not clear that the burning of coal to produce electricity represents the most efficient use of a given amount of water. The use of water for Kaiparowits may preempt the application of more desirable energy technologies, clearly a cost that must be given a greater consideration in the draft EIS. In this age of perpetual energy crisis, resource use decisions should be made with respect to efficiency criteria.

Water quality is a major problem in the Colorado River. Increasing salinity not only affects the productivity of water in certain uses, but also has a bearing on treaty obligations with Mexico.²³ Although the issue of Kaiparowits's effect on salinity appears to be unresolved in the draft EIS, it seems certain that over the lifetime of the project, water quality will be detrimentally affected. As is stated in the draft EIS, "with the proliferation of energy producing, water using projects, the cumulative effect . . . on water quality could significantly affect the long-term productivity of the region and those distant areas served by the Colorado River."²⁴ The Bureau of Reclamation recently estimated a downstream cost of \$230,000 per MG/l salinity increase. It is not clear in the draft EIS who will pay for these costs.²⁵

The use of water for Kaiparowits and for energy development in general in an age of water shortage will divert water from essential uses that cannot be valued in terms of dollars but, nevertheless, must be provided for. The Interior Department recognizes high quality recreation, fish and wildlife, and open space values of the Upper Colorado Region as national assets that should be preserved and given special recognition in land and water use planning.²⁶ Since the Interior Department has yet to quantify such water requirements, decisions on energy development should recognize the diversion of water away from these and other uses as a result, however indirect, of those decisions to a greater extent than the draft EIS does. Wildlife, including endangered species must be provided for. Ecosystems, the ultimate earthbound energy production units, whose existence man depends on, need water for survival. Wild and scenic rivers need water if they are to be viable entities. Water must be provided for the sole purpose of maintenance of water quality. Moreover, the ultimate use of water to man in a world of vanishing "natural qualities" may be its free flowing attributes. These elusive aesthetic and psychological values don't enter into present cost benefit analyses or into the draft EIS.

Ground Water

The draft EIS correctly recognizes the intimacy which ground water has with other parts of the environment, notably surface water. It states, "because of the close relationship between ground water and surface water . . . any adverse impact on one would eventually affect the other." (III-110) However, it seems that those collective impacts cannot be evaluated due to a lack of ground water data. For example, "movement from water yielding areas to Lake Powell is very complex and, because of the scarcity of data, poorly understood (III-110)."

Some of these unknown impacts could pose potentially serious problems regarding ground water quality. The draft EIS states (III-113), "over a very long term some of those elements [from the ash and scrubber sludge storage areas] could eventually reach aquifers, but data are not available to determine if this would result in toxic concentrations." Furthermore, "very little is known about those elements in the local ground water or how they move through the local ground water system." (III-116) Contamination of ground water will cause essentially irreparable damage due to low flow velocities and slowness of natural dilution.

In addition to these large gaps of knowledge, there seems to be several contradictions in the various ground water sections of the draft EIS. Page III-114 states, "information about the location, extent, and hydrologic properties of the perched aquifers, and the quality of water in them, is too meager to predict impacts on particular springs or to accurately evaluate them." This would seem to contradict information found on V-26, "Coal mining activities associated with the proposed project would disrupt perched aquifers discharge an estimated 160-acre-feet of water per year to seeps and springs . . . in Warm and Last Chance Creeks." This kind of information should be available in the EIS for all ground water areas which may be affected by the project.

Comments, such as, "the participants state the proposed (limestone) quarry would not be deep enough to intersect the local ground water table" (III-132) are misleading. This is especially so since the next sentence of the same page states, "however, depth or seasonal range in depth of the local ground water table in this area are not accurately known."

On the whole, the information presented in the draft EIS on ground water is inadequate to evaluate the impacts of the project upon these resources.

RECREATION

Visitation to Grand Canyon National Park as well as National Park Service units in Utah was up a combined 252 between January and September 1974 and the same period in 1975. Bryce Canyon National Park, the unit closest to the proposed plant site, had its total number of visits increased 432 during the same period. It is, therefore, evident that these areas are becoming increasingly valuable to the American people.

Resource practices that would allow the proposed Kaiparowits project are damaging to the integrity of the National Park System and threaten to render these islands of primitive America. No one would argue that it is appropriate to locate the world's largest coal-fired power plant on the rim of the Grand Canyon. It is equally inappropriate to locate such a project outside the Park boundaries when its emissions would fill the canyon with a noxious haze.

It should be obvious that there is a need to conserve and protect the national treasures of the Southwest. Activities such as the Kaiparowits project, which endanger their inherent qualities should be prevented. There is no counterpart to the system of canyons in the Southwest anywhere in the world. The principle benefits to be gained from the canyon country are the outstanding scenic, recreational, and aesthetic, and scientific values they possess. These are non-consumptive and are capable of providing essentially unimpaired benefits forever.

The National Parks and other areas of national significance in the Four Corners region will perhaps suffer the greatest unavoidable adverse impacts associated with the proposal (see map, page 27). This becomes apparent upon reading the draft EIS.

The unavoidable adverse impacts listed on V-53 only begin to quantify the problems which would result from implementation of the object. Such treatment does not take into account the unquantifiable environmental amenities which should be given the "appropriate consideration" as defined by NEPA.

The aesthetic impact evaluation on III-205-206 seems to arbitrarily classify visual intrusions which would be imposed by the generating station facilities. The "low" rating given for the Rainbow Point Overlook, Bryce Canyon National Park, is an incredible understatement. How can the visual aesthetic impacts be anything but severe from all the major overlooks listed on III-205-206? The monolithic plant would constitute a grotesque eye-sore upon the natural landscape. A point not raised in the aesthetic impact evaluation is that 4-Mile Bench is visible from all major overlooks in Bryce Canyon National Park.

The proposal for hauling limestone through Bryce Canyon 30 times daily in 25-ton trucks in one of the more offensive parts of this project. The accompanying noise, dust, and traffic congestion make such a

suggestion completely unacceptable. Compounding this potential problem is the 40 trips per day presently made by oil tankers.

One of the most dangerous unavoidable impacts associated with the proposal is the discharge of mercury from the plant stacks. It is inevitable that some of this mercury will enter into Lake Powell reservoir. Ambient concentrations in the reservoir are approximately .01 ppb according to a Lake Powell Research Project Bulletin entitled Mercury in the Lake Powell Ecosystem. Through bioamplification these ambient concentrations have reached 500 ppb in the upper trophic levels of the food web. This mercury level threatens to render the large carnos of the reservoir inedible. The U.S. Food and Drug Administration considers 500 ppb to be the upper limit for safe human consumption.

Mercury from Kaiparowits entering the Lake Powell ecosystem would almost certainly further aggravate the problem of mercury concentration in the fish of the reservoir. The draft EIS states, "fish most prized by the angler are the ones most likely to accumulate mercury levels unsafe for human consumption (III-154)." How will this affect the existing fishing resources of the reservoir, and the expected 15,000 additional man-days of fishing which the project is expected to cause? The answer given in the draft that fish of lower trophic levels, such as blue-gills, would be substituted for the large game fish, does not take into account that people may not want to make the switch.

Glen Canyon National Recreation Area was created (86 Stat 1311) "to provide for outdoor recreational use and enjoyment of Lake Powell . . . to preserve scenic, scientific, and historic features contributing to public enjoyment of the area." The Kaiparowits project could not possibly uphold this Congressional mandate.

If the project were to be approved, it would also relegate the principal legislative mandate of the National Park Service (NPS) to "paper tiger" status. The National Park Service Act of 1916 clearly established the fundamental purpose of the NPS "to conserve the scenery and the natural and historic objects and the wildlife therein . . . in such a manner as will leave them unimpaired for future generations." (emphasis added) Kaiparowits and the legislative intent of the National Park Service Act are completely incompatible.

Due to the large inflow of people expected to the region, there should be management contingency plans established by the various Federal land management agencies in the region. This would help to mitigate and prepare for the anticipated large population increase.

PALEONTOLOGICAL, ARCHAEOLOGICAL, AND HISTORIC

These resources are non-renewable and are important in providing evidence relating to species evolution, migration range, succession, interspecific relationships, the geologic past, and in constructing the pre-history past. The proposed project would eliminate any chance of maintaining a complete paleontological, archeological, and historic record for the entire Lake Powell basin. Direct destruction by means of road construction, building, and indirect destruction due to an increased accessibility to the region, increased off-road vehicular use, and increased local population pressure would result in illegal collection and vandalism of these cultural resources. Such destruction would constitute an irreversible commitment of these resources and prevent their use in future interpretation and scientific concerns.

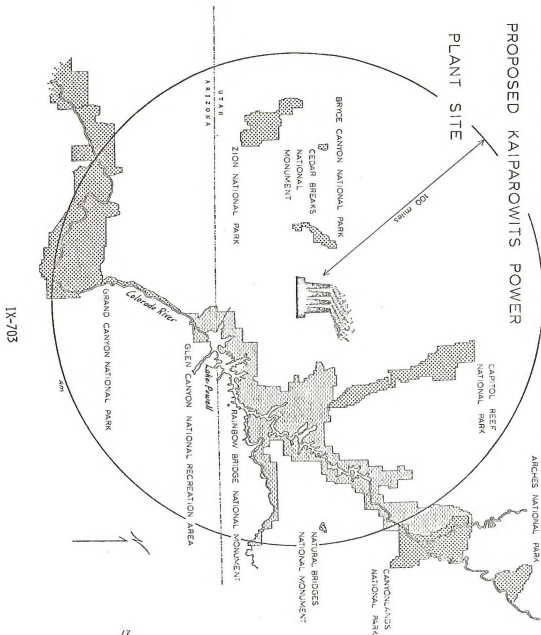
According to the draft EIS only a 10% survey has been completed in the impact area to determine potentially significant cultural resources (II-246). For the transmission impact area, "the number, kinds, and significance of sites that would be affected and the severity of impacts to these are unknown (V-51)." According to Executive Order 11593, Sections (2)(a) and (2)(b), no action could be taken in regard to Kaiparowits unless these missing data were quantified. Informed decision-making necessitates that the final EIS contain a complete reconnaissance of the proposed generating plant site, mine site, new town site, new highway, limestone quarry, access roads, water pipeline, pump stations, transmission lines, and any other ground disturbed areas in order to determine if any archeological remains are possible for inclusion in the National Register of Historic Places.

The final EIS should also contain the Memorandum of Agreement between the Advisors Council on Historic Preservation, the Utah State Historic Preservation Officer, and the proponents pursuant to 36 CFR 800.5 (g).

For example, the Perry Mesa Area, which contains a large concentration of Indian ruins, has already been nominated for inclusion in the National Register. This area will be affected by the Kaiparowits to Phoenix transmission system. Although the draft EIS lists known cultural resources of National Register quality, it does not make adequate allowances in its plan for discoveries of other areas equally suitable for inclusion.

The mitigating measures proposed by the participants are vague at best. "Potential effects and the degree of success of these measures cannot be evaluated (IV-41)." Nowhere in the draft EIS is there an outline of the proposed techniques to be used in minimizing adverse impacts.

Supposedly a "trained archeologist" would survey the proposed route before construction to locate any archeological sites that would be affected by construction of the proposed transmission lines (IV-45). Who would train the archeologist? Would he be a company employee? According to the participants, sites would be excavated or protected "as the archeologist deems necessary (IV-45)." Such decisions should not be made



unilaterally. The "trained archeologist" should consult with federal and state liaison officers in determining desirable protection of a particular site.

Court cases such as *Sierra Club v. Froehke*, (U.S. District Court, Southern District of Texas, Houston Division-No. 71-11-583) and *Mara Springs Task Force, et al. v. Lt. General William C. Gribble Jr., et al.*, (Supreme Court No. A-1145) have emphasized the need for adequate archeological surveys to be completed on certain lands to be developed. The draft EIS has not given such surveys the appropriate considerations they deserve.

SOCIO-ECONOMIC

Kane and Garfield Counties in Utah are expected to absorb the bulk of the 15,000-20,000 people anticipated to accompany the Kaiparowits project. However, prospects that the proposed "new town" development will be a larger Page, Arizona, are only reinforced by the current trend of advanced economic and social planning.

The draft EIS states, "Unless proper control is maintained, Kane County could experience a disproportionate crime rate and other problems similar to those experienced in Campbell County, Wyoming, where boom town conditions caused a dramatic rise in problems. "These problems are indicated to include divorces, arrests, public drunkenness, driving while intoxicated, and school drop outs. Just what constitutes "control" is not explicitly explained. Mitigation measures applicable to boom town growth may well be non-existent.

The draft EIS does not provide an adequate analysis of the present social structure of the region nor completely evaluate the social project will have upon current residents. The communities of southern Utah to be directly affected are to receive complete information regarding the proposed project and its effects on their existing life-style and social structure.

WILDLIFE

The draft EIS presents commendable treatment of the initial impacts the project will have upon wildlife populations. However, long-term and cumulative adverse effects upon these wildlife species also demand adequate treatment.

The document omits a number of important considerations in evaluating the ultimate effect of the project upon existing wildlife. The aspects of tolerance levels, population stability, migration patterns, habitat requirements, limiting factors, and ecological interrelationships of the affected species are given too brief a treatment.

Nevertheless, it is apparent that the project will eliminate or threaten a number of wildlife populations. The only antelope herd in the area would be wiped out by the new town. The herd of free-ranging bison in the Henry Mountains would be endangered by increased poaching and fallow of acidic and toxic materials. Desert bighorn migration routes between the Black Hills and the McCollough Range to the Coxcomb Mountains would be destroyed by transmission line routing. The remote mountain lion habitat of the Kaiparowits Plateau would become laced with access roads. Deer populations throughout the impact area would be drastically reduced by the cumulative effects of loss of habitat, water sources, and increased human access. Bird migration routes would be inhibited by the transmission lines. Wildlife habitats of all species would also suffer severe encroachment by the project's impacts.

The Endangered Species Act requires Federal Agencies to take action to protect, conserve, and manage the species and their habitats. A number of endangered species presently inhabit the project impact area. These species and their habitats are gravely endangered by the project.

Of particular concern are the brown pelican and the California condor. The brown pelican population would probably be eliminated as a result of the construction and operation of the proposed transmission line.

Stephen's kangaroo rat habitat would be threatened by disturbance and increased human activity.

Raptors, including the golden eagle, the ferruginous hawk, and the bald eagle, are especially sensitive to human activities. They are particularly vulnerable to powerline fatalities. These birds could be eliminated through the project impact area.

The protection of brown pelican habitat in the Overton Wildlife Management Area, Nevada, will be severely degraded by the local effects of transmission lines.

The Vegas Valley Leopard Frog habitat in Las Vegas Wash is seriously threatened by installation and associated impacts of the transmission lines.

Gila monsters and desert tortoises could be eliminated in areas traversed by transmission lines due to an increased human access.

Endangered species of fish in the project impact area including Monpa dace, roundfin, Colorado River squawfish, Gila topminnow, humpback chub, honeytail, Colorado cutthroat trout, and possibly other as yet unidentified species will be gravely threatened by the associated impacts of the transmission lines.

It is highly doubtful the impacts of constructing and operating the proposed facilities could be mitigated to the point where these endangered and threatened species were still not gravely threatened.

The cumulative impacts of the project clearly indicate the intent and purpose of the Endangered Species Act would be violated if the project were allowed.

VEGETATION

The extent of initial vegetational loss is amply defined in the statement. However, certain sections warrant further consideration.

Four Mile Bench supports an especially important stand of ancient pinon and juniper trees. Appropriate alternative uses of the area which would include proposing protection of this unique natural community are warranted.

The cumulative impacts of 5800 tons of salt dispersed from the project's cooling towers are not well defined. These salts would steadily accumulate during the lifetime of the project and have chronic effects upon affected plant species. Combined with the fly ash, toxic trace elements, SO₂ and NO_x emissions from the plant, a large area could suffer denudation. Streams, seeps and ground water supplies would become polluted by these wastes to an undefined degree. The undetermined effects of these pollutants upon the environment threaten agricultural productivity of a large region as well as aquatic life in Lake Powell reservoir.

WILDERNESS

The Colorado Plateau region is rich in wilderness resources. The Bureau of Land Management manages extensive de-facto wilderness areas in the region including three primitive areas, a number of natural areas and recreation sites, two proposed national conservation areas, the proposed Escalante wilderness area and several other proposed primitive areas. The BLM has identified 120,000 acres in the Kaiparowits Plateau region as a potential 50-mile Mesa primitive area.

The Forest Service administers extensive de-facto wilderness lands in the region. Five areas are being studied for wilderness and over fifty areas are inventoried as being in a wild and primitive state.

The forty National Park Service areas in the Colorado Plateau contain numerous de-facto wilderness areas.

Several de-facto lands, including those listed below, would be gravely affected by the project.

Primitive, Wilderness, Roadless, and Candidate Natural Areas in Kaiparowits Project Direct Impact Area

Generating Station and Mine Impact Area

- A. Paria Canyon Primitive Area
- B. Hackberry Canyon Roadless Area
- C. Fifty-Mile Canyon Roadless Area
- D. Back Country Area

Transmission System Impact Area

- Kaiparowits to Phoenix
- A. Sycamore Canyon Wilderness
- B. Pine Mountain Wilderness

Kaiparowits to Eldorado

- A. Paria Canyon Primitive Area
- B. Hackberry Canyon Wilderness Area
- C. Kanab Canyon Roadless Area
- D. Arrow Canyon Range
- E. McCullough Range

Hoenkopi to Mohave

- A. Navajo Indian Reservation and Hogans (Traditional Navajo home)
- B. Black Mountain Area
- C. Black Crossing via Secret Pass

Mohave to Serrano

- A. Sacramento Candidate Natural Area
- B. Old Woman Candidate Natural Area
- C. Turtle Mountain Candidate Natural Area
- D. Coxcomb Candidate Natural Area
- E. Eagle Mountain Range Candidate Natural Area

- F. Chuckwalla Candidate Natural Area
- G. Orocopia Candidate Natural Area
- H. Mecca Hills Recreation Lands
- I. Indio Palms County Park
- J. Pushwalla Canyon and Oasis
- K. Santa Ana Mountains
- L. Cottonwood Entrance to Joshua Tree National Monument
- M. Riverside County Indio Palms Park
- N. Pacific Crest Trail
- O. Colorado River

The environmental impacts imposed by the Kaiparowits project would contradict the intent of the Wilderness Act which sets aside these areas to remain in an untrammeled state.

The draft EIS should provide a more thorough evaluation of the project upon the regions wilderness resources.

TRANSMISSION SYSTEM

The physical intrusions created by the installation and operation of the proposed transmission system are given commendable treatment. Once again, however, cumulative impacts of the physical presence and biological hazards of these installations remain largely unknown.

The principal pollution hazard from the transmission lines is the production of ozone by corona discharge. The draft EIS states "ozone production impact would be insignificant along this entire route (II-16)." However, the cumulative effects of ozone produced by the transmission system are not outlined to support this finding. In addition, the contribution the transmission system will make to a global increase in ozone concentration is not mentioned. These considerations are important considering the health and biological hazards posed by ozone.

The modification of topography, visual intrusions, and disruption of ecosystems along the proposed transmission routes deserve additional evaluation. This transmission system must be considered in relation with other such proposals. Considering current proposals, there could be eight to ten transmission lines in the Kaiparowits-Eldorado corridor. This prospect again emphasizes the need for a regional EIS.

These comments are respectively submitted for your consideration.

Sincerely,

Gordon Anderson
Gordon Anderson
Escalante Representative
Friends of the Earth

Ron Rudolph
Ron Rudolph
Kaiparowits Representative
Friends of the Earth

William Silberstein
William Silberstein
Staff Associate
Canyon Country Council

GA/RR/WS/pl

FOOTNOTES

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4. Ibid., p. A133
5. Edison Electric Institute, Questions and Answers about the Electric Utility Industry, p. 32.
6. EIS, Ref. Vol., pp. A125-A126
7. ERCDG, p. 25
8. EIS, Ref. Vol., p. A728
9. Ibid., p. A705
10. FEA, Energy Conservation in the Manufacturing Sector 1954-1990, p. 12.
11. ERCDG, p. 35
12. Ron Doctor, Docket # 75-FOR-5 Concurring and Dissenting Opinion, p. 16.
13. Ibid.
14. ERCDG, p. 43
15. ERCDG, p. 37
16. EIS, Ref. Vol., p. A138
17. Ibid., p. A712
18. Ibid.
19. Ron Doctor, op. cit., p. 19
20. ERCDG, pp. 20-21
21. EIS, Ref. Vol., p. A105
22. Environmental Defense Fund, Docket # 75-FOR-5 Opening Statement, p. 12.
23. Ibid., p. 11
24. Environmental Defense Fund, Docket # 75-FOR-5 Supplemental Statement, Table I
25. Ibid., p. 3
26. Ron Doctor, op. cit., p. 5
27. Ibid., p. 22
28. EIS, Ref. Vol., p. A138
29. FEA, Solar Energy, p. 116
30. Ibid., p. 17
31. EIS, Ref. Vol., p. A725
32. EIS, Ch. 1, p. 41
33. EIS, Ref. Vol., p. A723
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12. WFE, p. 65
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19. WFE, p. 34
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COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT,

PROPOSED KAIPAROWITS PROJECT

Submitted by

Mary Belle Bloch
Southwest Energy Specialist

Introduction

The potential impacts from large scale energy development of southern Utah are tremendous. The draft Environmental Impact Statement for the proposed coal-fired electricity generating station and related facilities including a new town on and near the Kaiparowits plateau does not adequately assess the impact.

The preparation of this document was a massive undertaking by EIM. Portions of the draft are well-conceived and written. In addition, there are numerous sections that are inaccurate, incomplete and evasive. Vital issues are sometimes totally omitted. The comments which follow highlight some of the major weaknesses of this document.

The intent of these comments is not to be an exhaustive critique at a detailed level; on the contrary, what is stressed are the policy concerns inherent in such an extensive proposal. Basic policy decisions will dictate the outcome of all the minor resulting impacts; therefore, it is at this more fundamental level that the following comments are made.

Regional EIS

The Kaiparowits EIS represents the piecemeal assessment of the environmental impact of energy development in southern Utah. Since other coal-fired electric generating facilities requiring federal actions are being proposed within the Colorado Plateau Region, environmental impacts are regional, synergistic and cumulative. The Kaiparowits EIS cannot, indeed does not claim to adequately assess these types of impacts. A regional EIS appears to be mandatory in order to satisfy the spirit and intent of NEPA.

Numerous judicial interpretations of the NEPA have explicitly stated that the elimination of incrementalism from government decision making is a primary goal of NEPA.

Avoiding a consideration of the overall cumulative impacts obviously inherent in this region is what could be characterized as an arbitrary and intentional abdication of federal responsibility under the NEPA. To argue that this particular project is an autonomous and isolated action, divorced from any future activities or plans in the area, is clearly unsupportable. The checkerboard mix of federal, state and private land ownerships alone dispute any argument that what occurs in one area does not affect any other interests.

Where there is ample evidence that many circles are viewing the entire region as a possible regional energy basket, it seems imperative that any decisions made in the region must have, as prior basis for decisions, an overview or regional EIS.

Without such an overview, any commitments made for Kaiparowits, many being irreversible and irretrievable, could most probably preempt more environmentally sound and more economically efficient choices in the future (e.g., other locations outside Kaiparowits area, smaller plants, other coal or water uses, etc.).

The NEPA explicitly and directly requires a full detailed discussion of these "irreversible and irretrievable commitments" in the context and scope of their impacts; in this case, obviously regional¹.

Further, the Act specifies a requirement to assess short-term commitments with the long-range impacts.²

It appears evident to EDF that these two mandates, in addition to the aforementioned discussions or regional interaction, forces the conclusion that there is, at minimum, a direct and strong mandate by Congress for federal decision makers to be aware of the full extent of their commitments prior to making those commitments.

The narrow and somewhat shortsighted submittal of options and considerations by one applicant, in this case a public utility, should not be grounds for the responsible federal agency to endorse such a scope of consideration.

What should be before the people or a forum of review is the full range of both alternatives and impacts at the affected level, in this case, the regional level.

¹NEPA Section 102(2)(c) v.

²NEPA Section 102(2)(c) iv.

Vegetation

The draft EIS does not discuss the presence of protected, rare or endangered plant species on any of the proposed plant and town sites (II-3, 4; 157-61). However, the possible identities of various protected, rare or endangered species along each of the proposed transmission line routes is fully discussed (III-147, 8). Apparently the plant and town sites have not received as intensive study of protected, rare and endangered species as have the transmission corridors. Since vegetative impacts will be much greater at the plant and town sites, the EIS is inadequate in this regard until such studies are conducted and reported as part of an environmental report.

It is stated on p. III-139 that, "Unique vegetation would be disturbed on the Kaiparowits plateau (very old pinyon and juniper trees) . . ." but the age of the trees is not given, even though it is further stated in the same paragraph that "Old pinyon and juniper trees have some scientific value and could not be replaced in hundreds of years." However, "One 1,400 year old tree has been identified." (p. II-159). It is curious that a unique environmental situation such as this is described in such a nebulous manner.³

Socio-economic impacts

The analysis of socio-economic impacts should, as a matter of policy, be one of the most important assessments of the entire impact statement. The Kaiparowits project is a very large undertaking and it will exert extensive impacts upon a small traditional culture. The statement hardly alludes to this basic fact. Only one survey is reported, and it is not interpreted in terms of socio-economic impact. It is curious that Dr. Stan L. Albrecht's paper entitled, "Sociological Aspects of Power Plant Siting," published in May 1972, is not reported or referenced in the appendix. There is one reference to analogous situations in other western states. Evaluations such as Raymond L. Gold's "Social Impacts of Coal-Related Development in Southeastern Montana" (published in May 1974), of other rural "energy boom" experiences should be integrated into this assessment.

There is no reference to any probable socio-economic benefits or costs to citizens in other sections of Utah, such as the Wasatch Front (e.g., tax demand shifts, opportunity costs in the Wasatch Front resulting from extraordinary capital demands in the impact area). What are the im-

³The fact that the Utah State Legislature felt concerned enough about trees to pass a protective bill to preserve such resources shows these are resources of significant value (Utah Heritage Trees Act of 1975).

pects upon local government as contrasted to those for state government? Are there significant differences between Montana and Wyoming and the situation in southern Utah? Is the Kane and Garfield county situation unique and in what manner? The EIS seems to either avoid or omit discussion of any of these topics.

The alleged financial gain, supposedly to accrue to the more populated areas of Utah as a result of the Kaiparowits development, is not described in sufficient detail (p. III-268-9). The EIS should discuss the local costs (impacts) for new schools, law enforcement, sewage treatment, water and sewer lines and new gas and electrical lines, especially in the long-term beyond the peak employment periods. The EIS simply reports that a majority of the southern Utah residents do not want the project if it "causes local taxes to rise substantially" (p. A-582). Without discussing whether there is any relevancy or utility of including such a poll as a truly valuable contribution to the statement (which is highly questionable), the fact that it appears requires some comment. It also reports that 73% of those individuals polled in southern Utah said that they did not anticipate changing their employment if their community grew substantially (p. III-275, A-583). The implications of these responses and attitudes of residents in the impact area are not addressed.

Inaccuracies are found throughout the socio-economic sections of the draft EIS. For example, it is stated that "Major impacts would result from the rapid influx of some 14,000 individuals in a county of less than 5,000 in southern Utah and in Page, Arizona" (p. III-10, 11). However, the population of Kane County was estimated at 2,700 in 1973 and was 2,421 in 1970 (II-351). These errors are significant and they should be corrected. The population will more than double in Kane County in two years, whereas Gillette, Wyoming's population grew 121% in 10 years (A-575, 6). The present population of Kane County will be 371 percent greater by year 5 of the new town (II-35, III-255).

Further, the draft EIS refers to public opinion polls (p. III-11) and yet the draft presents the results from only one poll (p. III-268-95, A-577-600). To what other polls does the EIS refer? The public opinion poll which is reported states that 45% of the individuals in the total sample are retired (A-579). Does this mean that almost one-half of the population has left the labor force? Or, is the poll an inaccurate representation of the two counties? The environmental statement concludes that, "Many citizens and officials consider delays unnecessary and unwarranted." (p. III-11). This conclusion is not supported by the results of the public opinion poll. The EIS should supply evidence for this contention and the distinction between opinions of lay citizens and public officials should be drawn.

One other very major social impact which receives only cursory comment is what can be called "people impacts." Without trying to crystal ball these impacts, it should suffice to point out that this subject is almost ignored. (For example, how much additional money will have to be spent by the U.S. Forest Service to accommodate recreation demands on the Dixie Forest (if indeed such money is available)?

Alternatives

This appears to be the most inadequate section of the EIS. A voluminous amount of data is presented for various mine, plant sites and transmission line corridor alternatives. However, there is no serious discussion of any basic alternate generating station sites outside of Utah (111-7), or within Utah outside the Kaiparowits area. A hand study published in September 1972, entitled, *California Electricity Quandry* (5 vols.) locates potential generating station sites within California from which emissions would not violate present California air quality standards. Obviously, California siting is a major alternative, yet the EIS devotes approximately six sentences to this alternative. The FEA study is appended without discussion (A-69). The serious lack of consideration of alternative sites is clearly another shortcoming which should be a part of the aforementioned regional EIS.

The majority of the energy conservation measures which might result from an application of technology are available now. The applications mentioned have been incorporated into the daily operations and working philosophies of the federal government and many industrial concerns throughout the U.S. The application of these energy conservation measures (p. VIII-357-9) should be related to electric generating plants, rather than nuclear plants.

Attention is given to a capacity greater than 3,000 megawatts at the Kaiparowits site (VIII-21). Is this an alternative or is it a basic proposal that is presently being considered? The EIS (VIII-21) states that "participants would be receptive to a secretarial implementation of increased capacity. There is no discussion of a smaller size generating facility at the Kaiparowits site or elsewhere. This is an important alternative, since there is presently 18.6% of the venture unaccounted for.

Details of the recent California Public Utility Commission decision⁴ should be presented. The need for Southern California Edison and San Diego Gas & Electric Companies to make up 7.7 and 23.4% of their projected peak megawatt demand by 1982 with Kaiparowits (p. 1-15) should be reduced. The projections used by SDG&E and SCE are based on 1973 recorded peak demand and energy requirements. A decrease in California's electric consumption took place in 1974. Since a lower demand projection for California is apparently realistic, a situation of lower demand should be fully discussed as an alternative to the proposed action.

⁴State of California, Public Utilities Commission, Opinion and Order: 10-year Forecast of Electric Loads and Resources. Docket No. 75-FOR-5. 1975.

Air Quality

According to the EIS, visibility in the Kaiparowits region is presently 70 miles under average conditions. Background data suggest that average visibility prior to the Navajo plant was 90 miles and that background levels of various air pollutants "are at or below limits of detection of the monitoring units" (p. 11-1). Maximum visual ranges of 155 miles are reported for the region.

The statement notes that important studies of air quality are in process but the results are not available and thus cannot be used in assessing impacts upon air quality. In general, the EIS displays air quality data but does not discuss their implications for environmental quality.

The major aspects of air quality impacts are not discussed. Is the 155 mile visual range condition unique to the remainder of the United States? What is the effect of air pollution upon aesthetic conditions other than visibility such as air coloration? What is the relationship of air quality to the existing aesthetic amenities of the area such as the nearby national parks? What impact will the Kaiparowits plant have on this relationship? The EIS briefly states available measurements indicate that the area's air quality is "generally excellent."

An errata sheet devotes two paragraphs to the EPA limitations for significant deterioration and states that the "probability exists that the plume from the proposed project would violate the class 1 limitations." The EIS states that the implications for air quality of a class 1 designation will be discussed in the final EIS only if the areas are so designated prior to the date of publication of the final document. Since the authors of the EIS have been aware of the EPA limitations for at least 18 months prior to the issuance of the draft EIS, there is no reason that this potential situation be relegated to a discussion of four sentences in an errata sheet to Volume 1 of the draft EIS. This is a major deficiency of the draft statement. The environmental impact of the Kaiparowits project upon a class 1 air quality area should receive thorough scrutiny and evaluation for it is this impact that is viewed by many as the priority concern.

The basic thrust of the evaluation of air quality impacts is misdirected and does not analyze the important questions of air quality and its effects on other values, especially land use values in the region. The analysis that is presented is replete with inconsistencies, omissions and errors. For example, 12 tons of flyash, 250 tons of nitrogen oxides and 34 tons of sulfur dioxide will be emitted daily from the facility's stacks if the air pollution control equipment is operated at design levels. There is presently no operational and proven scrubber for removal of particulates of a plant of 3,000 megawatts. The Navajo plant equipment functions for a plant of one-half the projected size of Kaiparowits. Such assumptions of high level reliability are very suspect and require qualification.

In an area of such a high concentration of national parks, possible wilderness areas, natural areas, primitive areas, potential wild and scenic areas and recreation areas (e.g., Bryce Canyon, Zion, Canyonlands, Capitol Reef, Grand Canyon, Arches, Glen Canyon National Recreation area), all Congressionally or nationally endorsed, high visibility and normal coloration of the sky are vital assets of immeasurable value. The normal coloration of the sky is directly proportionate to the concentration of nitrogen dioxide present. Nitrates and sulfates contribute to light scattering. The large amounts of nitrates and sulfates that would be emitted could reduce the visibility to such an extent so as to significantly affect the quality of this vastly scenic area. "The effluent plume from the Kaiparowits project could potentially exceed the air quality limitations (assuming a class I designation) under some meteorological conditions (p. III-30)." Recent studies have predicted that a visible plume from the cooling towers "would occur 97% of the time, but half of the time it would disappear before reaching 200 feet" (p. III-49). These emissions will be evident generally reducing visibility either as a haze or as a fan from the stack. In addition to the reduction of visibility from the effluent and water cooling tower emissions, there will be disturbance or total elimination of vegetation of approximately 9,000 acres. Some 5,800 acres of this acreage will be permanently lost (III-7).

The proposed plant sites are visible from 6 easterly facing overlooks, including Rainbow Point Overlook (9,105 ft.) in Bryce Canyon National Park. It seems that areas approximately 16-24 miles away in a region where normal visibility is 70 miles and often as much as 155 miles the visual impact of the Kaiparowits plant is one of high vulnerability rather than low as stated in the EIS (III-203).

Further, it is stated that "A study (Bechtel Power Corporation, 1974) sponsored by the participant indicates that reduction of visibility of this magnitude (i.e., 10-20 miles) would occur infrequently" (p. III-207). In addition, it has been said of the Mipple Bench site in 1971 that "during the winter low level surface inversions were common, often strong enough to maintain themselves throughout the day" (p. II-49). These statements are in conflict. Atmospheric dispersal seems to vary seasonally.

In section 15 of the contract for water service from Lake Powell (p. A-197) it is stated that equipment must be designated for:

"removal of particulate matter of ninety-nine and five-tenths percent (99.5%) Such air pollution control equipment shall be operated so as to remove not less than ninety-seven percent (97%) of the particulate matter in the stack emissions in each month and not less than ninety-six percent (96%) thereof in any twenty-four (24) hour period, unless uncontrollable forces prevent such operation."

The reduction of these restrictions from 99.5% to 99% for flyash removal can double the emission level. A reduction of particulate removal to 97% will increase the emissions by 600%. This would be in violation of EPA air quality standards.

Trace elements, primarily heavy metals, could cause a major effect. Beryllium and mercury, generally considered hazardous, have no standards that apply to coal-fired power plant emissions. There will be a 33% increase in the concentration of mercury in Lake Powell after one year's operation of the plant. The levels of mercury in some of the fish species in Lake Powell are already in excess of the FDA standard (500 ppb.) The potential loss of this major regional recreational resource has very serious implications requiring more adequate discussion, especially in the long-term/short-term relationship section.

Inconsistency of the statements in the DEIS related to trace elements and their health effects are evident. In one place (p. III-35) it is claimed: "Based on a comparison of measured background levels of trace elements at Page and predicted ambient air concentrations using conservative assumptions, trace-element emissions are not expected to have a significant impact on health." However, it also appears in the statement (p. V-1): "Small amounts of trace elements, noise and engine emissions would be released and accumulated over the life of the plant and these have potential for adverse impact."

Water Quality

The EIS neglects to address the impact of deep well withdrawal of ground water for the proposed new town and the resulting depletion of ground water resources in this area as well as the Indian water rights. Also not dealt with are the effects of withdrawal of surface water from Lake Powell on ground water recharge. The combined effect of these two activities could have drastic impact.

It is not clear from the EIS whether the ground water for the new town is part of the allocated water from the Colorado River Basin.

"The salinity of the Colorado River would increase by about 2.1 ng/l (as measured at Imperial Dam in the lower Colorado River Basin) as a result of the proposed project" (p. V-26). The argument that withdrawal of water for use in the state for any other purpose would result in the same effect (2.1 ng/l) can be refuted on the basis that any other developments will exist over a period of years and at slower rates, whereby they can be offset by various projects of the Colorado River Water Quality Improvement Program. In addition, there may be some limits to the amounts of water which can be diverted legally under the Federal Water Pollution Control Act of 1972, due to the salinity impacts. Therefore, slower development of the water resources may well decrease or prevent salinity impacts.

Discussion of increased salinity in the Colorado River is confined to the effects of water withdrawal with no adequate analysis of salt content in surface runoff from salt deposition over more than 930 acres and from salt drift from the cooling towers.

Water Policy Alternatives

The evaluation of alternatives should include alternative uses of water. Utah is responsible for allocation of its share of water in the Upper Colorado River Basin throughout those portions of the state related to the Colorado River drainage. As a result of the responsibility and restrictions of the Colorado Basin Compact, when Utah, in the use of its waters under the Compact, makes a commitment for the use of 102,000 acre-feet of water on Kaiparowits Plateau out of Lake Powell, such action forecloses the use of the same amount of water at some other point in the state on a river or stream that is part of the Colorado River drainage.

If the decision is made to allow development of the Kaiparowits proposal, this commitment forecloses alternative uses of the water for the time period detailed in the agreement, with the exception of other minor uses associated with the power development. The assessment of the assets and liabilities such a foreclosure would create must first consider all reasonable alternative uses of the water and then compare the anticipated positive and negative impacts of the alternatives with those of the proposal. Although this evaluation is an extremely complex one because it involves many factors not yet assessed in any adequate manner (i.e., state-federal water ownership in the Colorado Basin, state water allocation policy, federal and state energy policy), the NEPA requires that this alternative evaluation be conducted.

There are critical environmental issues involved in deciding upon any alternative use. The issue of water use is perhaps the most critical of all resource decisions relating to energy development in Utah. Such a critical issue requires much more comprehensive analysis than is contained in the document to make any competent decisions which will maximize the long-term welfare of all those affected.

The proposed Kaiparowits alternatives use of water is only one of many intimately related decisions on use of Colorado River waters. To consider positive and negative aspects of this allocation only in the context of the Kaiparowits proposal would be a basic disregard of both the mandates of NEPA and the guidance for water planning issued by the Water Resources Council under the Water Resources Planning Act of 1965 (Public Law 89-80). As stated by the Council:

"These principles provide the basis for . . . planning of federal and federally assisted water and land resources programs and projects and federal licensing activities . . ."⁵

Alternative water uses can be identified at three levels. The broadest level is that of major institutional classes of water use, including agricultural, residential, commercial, industrial and recreational. More specific levels relevant to the Kaiparowits proposal are various alternative industrial uses, including energy development. Within the category of energy development various alternative types of energy development must be assessed, such as coal gasification, oil shale conversion, coal liquifaction, nuclear, and others.

All alternatives must first be specified as either viable or not within existing and future constraints on such use. The basic time constraint is the commitment period of the Colorado River agreement. It is during this time that there is the direct foreclosure of alternative uses of that water. Beyond this basic time frame the EIS should consider the secondary alternative foreclosures caused by institutional limitations during the agreement time. Are there future alternative water use demands occurring late in the agreement time period which would require commitment beyond that period but which the Kaiparowits allocation would foreclose any potential for allocating water to that use? Although a basic geographic constraint is the Colorado Basin within Utah, distribution of the allocated Colorado River water can occur legally anywhere in the basin. In the future, capabilities to export unused water from the basin must be considered an extension of this geographical limit.

There are socio-economic and environmental limitations which further refine potential alternative uses. Within the Colorado Basin, there are specific economic conditions forcing consideration of water use into fairly limited areas. Availability of access, infrastructure, and market are all keys to this identification, in addition to the physical limitations. The EIS should consider important environmental limitations such as the location of national parks and monuments, potential wildland, scenic rivers, other aesthetic in situ uses, rare and endangered species habitat, and other critical wildlife habitat.

The alternative of water use for energy development must address the question to what type of energy development should the water be committed. This question of energy development type must be addressed in a way that the ultimate yield of usable net energy is highest within other constraints of

⁵Water Resources Council, "Water and Related Land Resources: Establishment of Principles and Standards for Planning". Federal Register 38:174, September 10, 1973.

economics and the environment. The lack of consideration of such alternatives in the EIS reflects upon the adequacy of the entire EIS.

There are established criteria for evaluating water alternatives. When the water resource is under consideration, both the federal government and the state government must be involved. The Department of the Interior summarizes this situation by stating that:

" . . . sufficient water in the Upper Basin to meet energy developments and other anticipated needs to the year 2,000 will not be available unless certain state and federal actions are taken soon. The actions include strong state leadership in the resolution of water rights and water allocation actions and the attainment of efficiency in water use."⁶

The overall guidelines for the federal government are those developed by the Water Resources Council. The Water Resources Planning Act of 1965 (Public Law 89-80) states:

"The (Water Resources) Council shall establish after such consultation with other interested entities, both Federal and non-Federal, as the Council shall find appropriate, and with the approval of the President, principles, standards, and procedures for Federal participants in the preparation of comprehensive regional or river basin plans and for the formulation and evaluation of Federal water and related land resource projects."⁷

Under this directive, the Council has developed the basic criteria for environmental quality evaluations. These criteria should be addressed in the Kaiparowits EIS. The Council defines environmental quality as " . . . enhancement by management, conservation, creation, restoration or improvement of the quality of certain natural and cultural resources and ecological systems in the area under study and elsewhere in the Nation". Components of the environmental quality element or criteria include:

"a. Management, protection, enhancement, or creation of areas of natural beauty and human enjoyment such as open and green space, wild and scenic rivers, lakes, beaches, shores, mountains and wilderness areas . . .

"b. Management, preservation or enhancement of especially valuable or outstanding archaeological, historical, biological and geological resources and ecological systems . . .

"c. Enhancement of quality aspects of water, land, and air by control of pollution . . .

"d. Avoiding irreversible commitments or resources to future uses . . .

"e. Others: if other components are recognized, they should be explicitly identified and accommodated in the planning process".⁸

The best summary of the goal of considering environmental quality in water and land planning is in the Final Environmental Impact Statement on principles and standards:

"The explicit consideration of the environmental quality objective in formulating plans for the use of the Nation's water and land resources provides opportunity for consideration of significant enhancement of the quality of the environment. Rather than simply displaying environmental impacts, the planning process established in the principles and standards would require that plans be directed to meeting current and projected needs and problems as identified by the desires of people in such a manner that improved contributions are made to society's preferences for national economic development or environmental quality The identification of the specific components of objectives to the considered explicitly in plan formulation will necessarily involve an appraisal of future economic environmental and social conditions expected without the plan as compared to those desired by people for the planning area."⁹

The Council also issues this cautionary note about the perspective in which a project using national public resources, such as Kaiparowits, must be evaluated by the decision makers:

"While all forms of development and use affect and sometimes change the tenuous balance of fragile aquatic and terrestrial ecosystems, the implications of all possible effects and changes on such systems is imperfectly understood at the present time. In the absence of absolute measures or standards emphasize the need for a cautionary approach in meeting

⁶Water for Energy in the Upper Colorado River Basin, 1974.

⁷Ibid

⁸Ibid

⁹Ibid

development and use objectives in order to minimize or preclude the possibility of undesirable and possible irreversible changes in the natural environment."¹⁰

IX-715

¹⁰ibid.

17-7
T. ACOTHY E. WIRTH
In Denver, Colorado

COMMITTEE
INTERSTATE AND FOREIGN
COMMERCE
SCIENCE AND TECHNOLOGY

Congress of the United States
House of Representatives
Washington, D.C. 20515
November 11, 1975

WASHINGTON OFFICE
916 CENTER HOUSE OFFICE BUILDING
WASHINGTON, D.C. 20515
(202) 655-4541
DENVER OFFICE
3831 WEST COLFAX AVENUE
LAURENS, COLORADO 80125
(303) 636-5222

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to be almost entirely the product of "an analysis by each participant of its need for power from the Kaiparowits project." DES, volume I, p. 15. The Federal Energy Administration review of the participants' analyses noted the lack of other sources of data:

independent predictions of future demand would be useful in assessments of the need for new generating facilities. But no such comprehensive projections have been made for the Kaiparowits market area. Those projections which have been made are either lacking sufficient detail or rest on assumptions considered too speculative as a basis for planning.

DES, volume I, pp. 40-41.

A comprehensive, independent evaluation of the necessity for the project would be more than just "useful"; it should be an imperative. The Bureau would be negligent if it were to permit the construction, on federal land, of such an enormous plant without first having an unbiased determination of the need for it. Both common sense and the National Environmental Policy Act require nothing less.

The need for such an independent evaluation is all the greater because the data supplied by the participating utilities do not reflect the increasing national emphasis on energy conservation. The combined calculations by the four companies of their total energy requirements show an increase of over 100% between the measured 1973 levels and the projected 1985 levels. DES, volume I, figures 2, 7, 12, 15. Likewise, their combined calculations of per capita consumption show an increase of 90% between 1973 and 1985. DES, volume I, figures 4, 9, 11, 17. These projections differ little from historical patterns, but we are no longer in a time when those trends can or will continue. As we continue to move beyond our previous practice of unthinking energy consumption, the figures used to justify the project will likely become more and more overstated.

Recent figures from Southern California Edison Company -- the utility slated for 40% of the Kaiparowits output -- dramatically illustrate this changed situation. Contrary to their projections

Mr. Paul L. Howard
State Director
Bureau of Land Management
P.O. Box 11505
Salt Lake City, Utah 84111

Dear Mr. Howard:

This letter is in comment on the draft environmental statement for the proposed Kaiparowits Power Project (DES 75-43). As a member of the Interstate and Foreign Commerce and Science and Technology subcommittees having jurisdiction over energy matters, I am particularly interested in this proposal.

First, I would like to commend the Bureau for extending the period for comments from the end of September until the middle of November. Given the enormous scope of this project and the complexity of the draft statement, such an extension as was granted is minimally necessary to provide the public with a reasonable opportunity to play a significant role in this stage of the decision making process.

The purpose of an environmental statement is to provide the lead federal agency with adequate information on which a well-informed decision can be based. While it is apparent that a lot of time and effort went into the preparation of this draft statement, it is equally apparent that the draft needs to be revised if the final statement is to serve its purpose.

The subject area in which the draft is most sadly deficient, unfortunately, is the threshold issue of the need for such a massive power project. What information is provided is admitted

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in the draft statement, Edward A. Myers, Jr., vice-president of the Company, was quoted in the October 30 issue of The New York Times as saying:

In 1975 -- the first half of the year -- compared against the time before the energy crisis of 1973, residential ran 2 per cent below pre-crisis 1973 despite the addition of 100,000 new meters over the two years period. Commercial sales in 1975 were still running 2.9 per cent behind 1973 despite new hospitals, shopping centers and major office buildings. Industrial is running 8.9 per cent behind.

It should be noted that this decrease in both total energy consumption and per capita energy consumption happened before the establishment of a comprehensive national energy policy. Although we still do not have that policy, conferees from the House of Representatives and the Senate are now in the final stages of agreeing on the provisions of a comprehensive energy bill. Under that bill, the federal government will take a stronger leadership role in both requiring and providing incentives for energy conservation. As a national policy to reduce consumption is enacted and takes effect, the projections in the draft statement will become even more out of date.

In short, the draft statement does not provide adequate information for a determination of the need for Kaiparowits. The final statement should include new data from the participating utilities that reflects, as much as possible, the change in our pattern of energy consumption. Also, that data should be independently evaluated from within the framework of a national energy policy. While this reassessment might mean a slight delay in the preparation of the final statement, the measures that have already been taken to conserve energy have been effective enough that the utilities and their consumers would not suffer from a relatively short delay.

There is another, perhaps even more compelling, subject for which the proposal needs to be evaluated from within the framework of national policies and laws. The Committee on Interstate and Foreign Commerce has before it a bill to amend the Clean Air Act. The provisions of the bill dealing with significant deterioration of relatively clean air, if enacted in its present form, would

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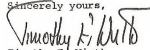
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preclude development of Kaiparowits as proposed. As approved by the Subcommittee on Health and the Environment, the bill would classify all national parks over 10,000 acres where national ambient standards are not exceeded as areas where only small increases in air pollution would be permitted. I understand that the Senate subcommittee working on amendments to the Act has adopted a similar provision. Since the pollutants emitted by the project could degrade the quality of air over seven national parks, the State of Utah might be prohibited from issuing an emission permit to Kaiparowits. The pure air of the region around the proposed plant, and the possibility of legislation preventing the deterioration of that air, are important enough that any decision on Kaiparowits should be postponed until Congress makes this determination of national policy.

I trust that you will fully follow both the letter and the spirit of the National Environmental Policy Act by considering these issues. I thank you for your attention.

With best wishes,

Sincerely yours,


Timothy E. Wirth

TEW:g

IX-717



INTERESTED IN SAVING SOUTHERN UTAH'S ENVIRONMENT

POST OFFICE BOX 728
CEDAR CITY, UTAH 84720
TELE: (801) 586-4001
November 13, 1975

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Kaiparowits EIS Team
Bureau of Land Management
P.O. Box 11505
Salt Lake City, Utah 84111

Gentlemen,

Enclosed is the ISSUE! evaluation on the Kaiparowits Environmental Impact Statement. We request that it be made part of the record.

Once again, thanks for a good effort. And thanks for giving us an opportunity to comment.

Lloyd Gordon
Lloyd Gordon
Executive Director

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Our compliments to the authors of the Kaiparowits EIS. Except for deficiencies in the discussion of alternatives to the proposed project and a consideration of national and regional energy policies, we believe the EIS is a commendable piece of work.

The EIS proposes that certain companies will use a certain amount of coal and water to deliver a certain amount of energy to urban areas of the southwestern United States. An alternative proposal is noted on page VIII-376 which would use 3.5 times more coal, the same amount of water, and deliver several times as much energy to the urban areas of the southwestern United States. Since water is the limiting factor on industrial expansion in the southwestern United States, one wonders why there is any choice at all.

The problem seems to lie in the historic approach to industrial growth. Normally demand for goods or services is expected to tempt an industrial effort to increase supply, and normally approval is granted any project unless there are compelling reasons to reject the proposal. The problem with the traditional approach is that it always assumed that there were enough resources to go around, and that an increased supply could be delivered if the price were right.

If, however, there simply are no more resources, the price rises without a corresponding increase of the resource. Colorado River water sold for \$7 an acre foot ten years ago; now it exceeds \$200, and there has been no perceptible increase in supply, nor is there likely to be, at least on a scale to support exponential consumption.

When supply exceeds demand we can afford to be wasteful; in times of scarcity we ought not to waste. If the southwest has only a few more acre feet of water to dispose of, we can spend it on the first thing that comes along or we can take a dispassionate look at what we are doing, and insist that the resource be used wisely.

If we need large amounts of energy derived from coal, as the federal government and industry insist we do, then how do we justify a project that gives us only a fourth as much energy per acre foot? Because that's the way we always do it?

The EIS shows that a powerplant in California can use coal gas to generate electricity for nearly the same price as a powerplant burning the coal in Utah. If the demand for electricity does not follow the projections of the utilities, as has been suggested by the California Energy Resources Conservation and Development Commission, then the gas is available for other purposes. In fact, if the gas is available in California, it can be used directly where applicable, i.e. space heating, at a considerable increase in efficiency. We note that if the gas is used in California to generate electricity, sea water is available for cooling purposes.

...TO COLLECT INFORMATION ABOUT OUR ENVIRONMENT
...TO MAKE THAT INFORMATION AVAILABLE TO THOSE WHO CAN DO SOMETHING

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Which suggests that computer modeling of plume behavior leaves something to be desired. Long term visual observation of the Virgin River Canyon and the Arizona Strip indicates that power plants have a substantial effect on visibility even when operated with modern pollution control equipment. The Virgin River, located just west of the Colorado Plateau, is frequently without control equipment during 1974. The plume travelled nearly intact for distances in excess of one hundred miles, and had a substantial effect on visibility in Zion National Park. A general haze has developed over the Arizona Strip, almost certainly the result of operations at the Mohave Generating Station. The Las Vegas and the Kaiparowits plant would be larger than those two put together, and presumably have a more impact, even if operated with the best possible control equipment.

bring speculation in land and housing and create a severe squeeze in the availability of personal credit needed to offset the upward rush in the cost of living." -- a.l. Tribune, 8-21-75

Some of the problems created by a very large influx of new workers and their families can be alleviated by proper planning and funding. The Call Engineering Company study is fine as far as it goes, i.e. how many houses are needed, what kind of streets, etc. But information is completely lacking on who will fund all of the community services. Presumably, until the town is incorporated, the burden will fall upon Kane County. How will Kane County handle the problem? Estimates in other areas indicate a capital investment for community services in the neighborhood of 20,000 to 25,000 dollars. A proper evaluation of a new town cannot be made until information is provided.

- B. The regional impact of many large power plants has not been sufficiently dealt with. Studies in New England show that acidic rains caused by fossil fuel combustion may be retarding plant growth by 15%. How many ppm of sulfur can we tolerate in the ambient air before we create a detectable impact on agriculture? How many power plants are advisable from an environmental standpoint? What is the rate of sulfate production from the sulfur oxides that are released? The NIS is deficient from this standpoint.

In relation to the above, we have noted that visual impacts are not as predicted in the computer models. We cannot know precisely what assumptions were fed into the computer model, but by inference we would judge that each component of the plume is analyzed separately. The NIS notes that sulfate conversion is dependent upon humidity, but apparently takes no account of humidity within the plume itself -- it mentions only ambient air humidity. We suggest that large amounts of water vapor are necessarily present in the plume -- partly from combustion, and probably because the plume from the stack joins with the cooling tower plume. Another matter dealt with is the presence of carbon dioxide, nitrogen oxides, and a fairly high energy (heat) content within the plume. The oxides would seemingly tend to form an acidic environment, which, ~~amplified~~ coupled with a high high energy content, may provide more ideal conditions for the formation of sulfates than previously anticipated. We do know from observations of the stuff in laboratory jars, that sulfates are visible, and we wonder if what we see is or is not sulfate.

- C. The section on alternatives is incomplete. Coal gasification is mentioned as a possible alternative, but not much more than mentioned. What will the effect be on energy supply if this option is supported instead of the power plant? What effect on employment in Utah and in California? What will be the effect on energy prices (the cost per kilowatt hr. is not the only factor.) What are the comparative environmental side effects? What effects on aesthetics when the two are compared?

The FEA analysis on energy conservation proposals is interesting, but again incomplete. If conservation is less capital intensive and more labor intensive, why dismiss it as simply unattractive to utilities? What incentives would be needed to promote conservation? Who would do the work? How many jobs would be created? What would be the effect on energy prices, and therefore inflationary pressures?

- D. The above questions are relevant to any discussion on the suitability of a power plant in Kane County. Under the principles of NEPA, significant questions should be answered. We recommend that the Kaiparowits EIS be rewritten to provide information on these questions.

B: THE KAIPAROWITS GENERATING PLANT

- A. Based on available information, we recommend that the Kaiparowits powerplant be rejected. Secretary of Interior Morton rejected the proposal two years ago. Among other reasons given was the lack of overall planning for the southern Utah area. Secretary Morton told the House Commerce Committee that basic decisions regarding the development of southern Utah should be made prior to the approval of a project of this magnitude. The reasoning still holds.

- B. The powerplant should be rejected because it represents a wasteful use of the southwest's most critical resource -- water. The alternative of gasification will supply 3-5 times as much energy for the same amount of water. How much water should be devoted to energy production and how much devoted to other forms of use should be determined in advance of approval of any specific project.

- C. The powerplant should be rejected because it will violate the provisions of the Clean Air Act, which provides that uncontaminated airsheds shall not be contaminated by new projects. Energy can be obtained from Utah coal by processes which are economically competitive, technically feasible, and which do not pose an environmental threat.

- D. The powerplant should be rejected because it will limit the total amount of energy produced in the southwest (because of the shortage of water), because it will increase the price of energy (coal gas used where appropriate is cheaper than electricity) and because it will limit employment opportunities in Utah.

- E. The powerplant should be rejected because the United States cannot afford to waste investment capital any more than it can afford to waste energy. If energy conservation measures can be applied for about a 1/3 capital investment, that alternative needs to be vigorously pursued. Energy conservation effectively provides

more energy, but does not increase the price of energy. New powerplants do increase the price of energy. "Utah Power and Light co. will seek rate increases...to normalise accelerated depreciation, as well as partial allowance for construction work in ~~xxxx~~ progress".....S.L. Tribune, 8-21-75.

- F. The powerplant should be rejected because it is better policy to provide coal gas in the market area, and permit the market area to choose between direct use of the coal gas and the production of electricity from that coal gas. In other words, free market competition vs. vertical integration and control by a few select large corporations.

These are the comments of the Southwest Powerplant Information Center on the Draft Environmental Impact Statement for the proposed Kaiparowits coal fired powerplant. Please include this statement in the official record of the hearings.

The statement is divided into various sections dealing with various aspects of the issue.

PARTICULATE EMISSIONS

One of the most glaring omissions in this Impact Statement, and an omission which completely overlooks the dangerous quantities and qualities of contamination which will be emitted by this installation, is that related to the trapping of the particulate or ash. Uncombustible mineral matter makes up approximately ten percent of this coal. Added to this is the partially burned or unburned coal which is also discharged into the atmosphere. As noted by the U.S. Public Health Service publication "Atmospheric Emissions from Coal Combustion":

Ideally the only particulate emission would be the mineral ash; however, 0.5 to 5.0 percent of the combustible content of the coal can also be emitted as particulate matter. Thus more particulate matter can be emitted than there is ash in the coal. Associated with the combustible content are the polynuclear hydrocarbons... There is much interest in these substances because of their carcinogenic (chemical cancer agent) properties."

Concerning how effectively power plants control equipment filters out the carcinogens and smaller ash particles, the same publication states:

There was little if any reduction in the polynuclear hydrocarbons after the effluent passed through control equipment. This seems to indicate that polynuclear hydrocarbons are found in particles of less than one micron in size and are not easily collectible.

Thus, with this fuel to be burned, up to fifteen percent of the coal can end up as particulate matter.

The figures given in this Impact Statement for particles to be produced by this installation per day range from 2440 to 2675 tons of flyash and 610 to 672 tons of bottom ash--or 3050 to 3347 tons of particulate matter per day (127 to 139 tons produced per hour).

So much more of the finer flyash is produced than the larger bottom ash because the coal is first ground to talcum powder consistency, then blown into the furnace, in contrast to older methods which produced much heavier ash particles.

How much of this enormous quantity of ashes will actually be trapped instead of being ejected into the atmosphere?

Here this Environmental Impact Statement--as it is in so many other aspects of pollution control--is totally deficient, just assuming without discussion or question figures, statements or assumptions made by the participants.

The language used to describe what the participants will do, and what they will install, gives both the drafters of this Statement and the participating utilities an easy release if the contamination produced by this gigantic facility is too dangerous and offensive.

In numerous places in the Statement the phrase is used, "The participants propose... to install equipment with design efficiency of 99.5%," or that as on page IV-7, "The project is proceeding on the basis that the following levels of emission control will be attainable." Never is any positive statement used such as the participants insure, or guarantee, 99.5% particulate control. The reason for this is abundantly clear to all familiar with what "design efficiency" really means.

This is a figure supplied by the manufacturer for his own device--primarily for competitive purposes. During the U.S. Senate hearings held in five cities of the Southwest on problems created by these power complexes, an official of the Southern California Edison Co., Howard Allen, made it abundantly clear how one should interpret the phrase "design efficiency".

"Since we purchased our precipitator four years ago (for the Mohave plant) manufacturers have been claiming for sales purposes design efficiencies of 99 plus percent, but we don't know of a single precipitator which has been in operation continually at such high percentage ratings." Somewhat later, William Reilly, an executive of Arizona Public Service Co., operator of the Four Corners plant stated:

"The first units were equipped with dust collectors which never worked and haven't worked to this day. The second set of units are equipped with electrostatic precipitators which have never been accepted from the contractor because they haven't reached design efficiency... Under an Interior Department agreement the Arizona Public Service Co. didn't have to install further pollution control devices on its three units until the electrostatic precipitators on the larger units were found acceptable."

And concerning the third huge electrical power production facility put into production in the Southwest--Huntington Canyon Utah--its Impact Statement made the declaration by the TVA concerning "design efficiency" and the meeting of emission limitations:

"We have no knowledge of precipitator manufacturers who can supply equipment to remove 99.5% of the flyash in power generating facilities, particularly when the sulfur content is only 0.5%. With the ranges of BTU and ash content of the coal indicated for this plant, about 99% collection efficiency will be required to meet the emission criterion. It is highly unlikely that sustained performance at this high level of efficiency can be obtained with the best operational efforts possible."

After a plant has become operational, one has only to become aware of what has occurred at the Four Corners to realize that collection efficiencies mentioned by the manufacturer and those in effect after the system has been worked over by the load of corrosives and particulates are generally not the same and in fact hardly resemble each other.

From all this it is apparent that there is an irreconcilable and very large chasm between the almost perfect figure assigned to design efficiency by the manufacturer--and accepted without comment by the authors of this Statement--and the actual operating performance of the product in question. This is why on page IV-1 it is stated:

"Air pollution control equipment would be operated to remove not less than 97 percent of particulate matter from stack emissions in each month and not less than 96 percent in any 24 hour period."

Do two or three or more percentage points make any difference? To the BLM employees paid to grind out this Statement and to those preceding it, and to the utilities, obviously not. They would sooner take little mention of it. To those who have to endure the massive atmospheric refuse discharged from this gigantic coal burning operation the situation is much different and much worse than the innocuous picture painted in this document.

Emitting but 1/200 (1/2 of one percent) of the flyash that will be produced by this facility, if it is built, at least 13.5 tons of particulate will be pumped into the atmosphere each day. Emitting one percent will double the emittance to at least 27 tons per day. Over the long term at 96% efficiency--which is much closer to that achieved in present plants than the almost perfect 99.5 figure--eight times more flyash will be released or 108 tons a day from this single plant (4.5 tons each hour).

The worst part about this tremendous contamination in addition to the unbelievable quantity is the type of effluent which will be ejected from the stacks after having passed through the so called control equipment. Here again the Impact Statement is silent--another sad commentary on its objectivity and completeness. It is as if important considerations ignored are ones that do not exist. And is the exact opposite of the purpose of the Statement as declared on page I-1: "To set out environmental values that would be damaged so they may be considered by decision makers."

Because the coal is first powdered and then blown into the furnace, billions upon billions of micron and sub-micron size particles (1/25,000 of an inch or smaller) are produced in coal burning operations such as these. Particles of this size are called aerosols because they remain suspended in the air over long periods of time. These particles because they are so small and light and behave like gases are much less amenable to being trapped. Unfortunately, this is also the size particle most injurious to human (and animal) health. Too small to be readily visible they stay suspended in the atmosphere indefinitely, spreading out from the source over long distances. Floating in the air, the particles are readily inhaled and because of their size pass right through the nose and upper respiratory tract to lodge in the

bronchial tubes and lungs. With the years, these fine particles form coatings which become increasingly thick and widespread. With increased pollution, contaminant deposits build up to weaken the lungs even faster. Respiratory diseases such as bronchitis--inflamed and swollen air passages leading to the lungs--and emphysema, which is the destruction in the lungs themselves of air sacs by the enlargement and growing together of the alveoli (bundles of blood vessels), take on real meaning when these same lungs are known to be scarred by gaseous contaminants, and are inflamed and encased by black particle matter.

What is to prevent a buildup of this sub-micron matter to higher and higher levels in the atmosphere? Apparently nothing! The particles are so easily kept airborne that each day's production from a giant station such as these far outweighs the amount that falls out. Thus five plants, emitting a combined total of 300 tons per day after all five plants' control equipment has done its best job, are far more a danger than a formerly half-controlled plant such as the Four Corners which by itself has emitted about 500 tons per day. The concern is not with what is removed from the smokestack itself, but rather with what enters the atmosphere. Most of what is removed would soon fall out in any event, and even though it would dirty up the countryside, is not the proper size that is easily inhaled and then lodges deep in the lungs. The total of 300 tons of sub-micron particulate, though, makes for many times the dangerous matter in the air that even a completely uncontrolled plant could put out, and in addition the 300 tons of fine matter are added to that emitted and still airborne from the previous days' and weeks' discharges.

Since a large part of the matter not trapped is the harmful less-than-micron size, and because a great percentage of the most dangerous to health sub-micron size particles get blown into the atmosphere whether there are controls or not, such controls do not even begin to adequately serve their purpose, which is not to have a less black discharge to promote better public relations, but to have a discharge which is not harmful to our health. No technology is in existence and literature indicates that a breakthrough is not contemplated or even possible in regard to the effective control of sub-micron particles. The only available and foreseeable control to the ever more concentrated massive dissemination of such particles on the Four Corners (Colorado) Plateau is the shutdown of all such plants located on the Plateau and their removal outside the Plateau's boundaries if they must be operated.

SULFUR OXIDE EMISSIONS

Again as with the particulates, nowhere in the Impact Statement is the 90% proposed figure for sulfur oxides discussed, debated or challenged--only fully accepted without hesitation. Whether any apparatus which may be installed can work at a reliability even remotely resembling 90% is highly doubtful. The only basis mentioned for any

kind of sulfur oxide control at all is a "study" made with miniature equipment (pilot plant) at the Mohave plant. There is no mention of any similar massive plant to the Kaiparowits, burning low sulfur coal, that has installed any such equipment and achieved the results "proposed" here. Such a system appears to be a first and thus the operating results at this time have to be nothing if not questionable and speculative. This especially in the light of past attempts and failures over many years to achieve workable and reliable gaseous sulfur treatment equipment.

In the words of Dr. A.B. Slack, chief chemical engineer for the Tennessee Valley Authority during the time of the Senate hearings:

"As yet we do not have the answer for removal of sulfur oxides from emissions of coal burning powerplants...The TVA has been working on the problem for 25 years."

One aspect of the problem as explained by George Weidersum, senior engineer for the Philadelphia Electric Co., involves the concentration of pollutants:

"It is much easier to remove sulfur dioxide when the concentration is high, but even after removal, smelter exit concentrations are 0.3 to 0.8 percent, which is higher than untreated power plant gases. Therefore smelter scrubbing systems achieve a sulfur dioxide level that is, at best, the level of most concentrated power plant gases and, in the case of the four Corners plant, a level three to four times higher. This very low concentration is the primary reason that the removal problem is so difficult for powerplants. Other obstacles are: the short time available in the boiler for reaction (three seconds at most), rapid temperature decay in that time (2800 degrees F. to 300 degrees F.), contamination with ash, tremendous gas volumes (millions of cubic feet per minute), and varying input."

With the Kaiparowits coal being even lower sulfur than the Four Corners (.52 compared to .7) the problem here would be even greater than if such a proposal were made for the smaller Four Corners plant.

With the tremendous problems encountered by present day installations of a much smaller size in continuously and effectively removing dangerous oxide gases from the stacks, it is a cruel delusion to lead the public to believe that such control will all of a sudden be achieved here in the largest coal fired plant ever contemplated.

NITROGEN OXIDE EMISSIONS

Most aspects of pollution control discussed in this Statement are characterized by omission of critical considerations. Nitrogen oxide emissions, if this plant is ever built, will be thousands of tons per week. Because there are no known control devices for nitrogen oxides, mention of this dangerous class of pollutants (one of the principal ingredients of photochemical smog) is given but the most cursory consideration even compared to the omissions and misleading treatment given to

the other two primary pollutants.

It is a strange coincidence that the level of nitrogen oxide emissions given will be exactly at the limit supposedly allowable--no more, no less. Anyone familiar with what has occurred in the Southwest because of these massive coal burning operations will have some of his worst fears confirmed as he attempts to unravel the bits and pieces concerning nitrogen oxides spread out in various places in this Statement. For many years boilers have been designed to reduce nitrogen oxides. These efforts have produced but little effective reductions of late because most every conceivable boiler and firing arrangement possible has already been tried.

Thus there is no problem of disposing of trapped nitrogen oxides because there are no effective means of removing these oxides from the stack gases. Consequently, they are disposed of on all these plants by being discharged into the atmospheric sewer known as our air supply. Unable to be seen until they react with other gases, notably hydrocarbons from combustion including those from the plants themselves and sunlight, they soon form the ugly yellow-brownish clouds now well known over the industrialized world. Major components of this eye-smarting noxious airborne filth, nitrogen oxides, because of their corrosive and poisonous properties, are no better for other organs such as the lungs than they are for the eyes, and through their interaction with other pollutants cause more harm and damage when all work together than each could cause singly. Here too in these plants, with the release of thousands of tons of nitrogen oxides weekly from each facility, is a prime example of man's technological success (at building huge furnaces and burning enormous amounts of coal) but next to total environmental failure.

How then will there be "31 percent control of nitrogen oxide emission," (p.111-2) reducing "unabated NO_x emissions from 114 tons per hour or 94,174 tons per year to 10.40 tons per hour or 63,598 tons per year" (p.1V-8)?

"Effective boiler control" is mentioned here which supposedly will reduce the emissions to exactly that of the standard. As with the Interior Department contract stating that 99.5 percent design efficiency equipment will be installed, and that always the figure most noted and given the widest publicity--while the equipment operating efficiency over the long term has always been much lower--so the phantom oxide controls are also a sham and a deception. No explanation is given anywhere in this Statement for how the boilers will miraculously produce only two-thirds of what they normally would--5 tons less an hour (120 tons less of nitrogen oxides per day).

It appears that this unheard of reduction will be made because the participating power companies, in order to quiet fears, and to get all the necessary permits to start construction, have stated that they will meet all the standards. And since they will not meet the standards unless 100 tons less of nitrogen oxides are produced, they have declared in the Impact Statement that only this permitted amount, which comes out to some 250 tons per day, will be released--whether it can in reality be achieved or is possible. The EPA regulations or standards, even though

very lenient and rarely enforced, were set up for good reason—primarily because such oxides are dangerous to human health (as is the other plant effluent). "Nitric oxide is a colorless poisonous gas obtained by oxidation of nitrogen in making nitric acid." And, "nitrogen dioxide is a compound of powerful oxidizing properties, obtained as a reddish-brown suffocating poisonous gas by mixing nitric oxide and oxygen."

Even though neither here nor anywhere else in this verbose document is there any indication given of how dangerous and poisonous the nitrogen and sulfur oxides are, some hint is given of the visible atmospheric contamination that will accompany this immense coal burning. One conclusion given in numerous different places in this EIS including page III-37, V-14, A609 and many others is, "The study concluded that it would be necessary for an observer to look directly along the plume centerline in the direction of the station before any visibility reduction would occur. Visibility reductions in these cases were approximately 10 to 20 miles. Visibility reduction from other lines of sight was insignificant."

Actual observation of the emissions from the existing power plants in question including the latest at Page Arizona, only 35 miles away from the proposed Kaiparowits (which is now emitting only one third of its planned pollution, show that visibility is reduced and interfered with from any angle the emission plume is viewed.

The study referred to here just happened to be made by a division of Bechtel Corp., the builders of the installation at Page and also of the proposed Kaiparowits. Would any other conclusion be expected from an organization which builds power plants? Are these unbiased, objective, impartial "studies" made by a neutral observer?

The statement "visibility reduction from other lines of sight was insignificant," is especially arrogant assuming as it does that the power plant is already built, that observation of the plume has already been made and that in the writer's view "the visibility reduction was insignificant." One has the feeling that these huge coal burning installations would have to create a complete blackout before the authors of the "study" would term it of any significance.

A paragraph on page V-14 gives some idea of how misleading these power plant participants and their so-called consultants can be in spite of an abundance of visible and other evidence (of present day plants) contrary to their contentions. Here also the particular writer has attempted to restore some reality to the harmless picture painted by the participants and their hired operatives.

"Nitrogen oxides released during coal combustion would produce a periodic yellow-brown discoloration proportional to the nitrogen oxide concentration. This could contribute to overall degradation of the visual environment. Studies by Bechtel Power Corp.

(1974) have indicated the brown discoloration would usually not be noticeable unless the observer was looking along the plume axis. However, the plume at Navaho is quite noticeable from any angle." (emphasis added.)

This Environmental Impact Statement as it concerns pollution control is replete with distortions and deceptions. The extent of the pollution and the danger associated with it are all downplayed. Highly important considerations are totally neglected—examples of which have been pointed out here. One wonders who was responsible for this completely unacceptable Statement of the environmental impact of this proposed action. The New York Times of Feb. 9, 1975, supplies the answer.

"Consideration of the long range impact of development is mostly given a lick and a promise, and in some instances, the bulk of the Environmental Impact Report data is furnished by the developer utilities themselves."

TRACE ELEMENT EMISSIONS

This EIS may have set a record for inadequacies, contradictions and self-confessed and other unknowns. Constantly in evidence are the statements, "...the impact is not well defined...because of scarcity of data is poorly understood...a relationship can only be predicted with recognized uncertainties...predicting possible long term cumulative effects is difficult...there are presently insufficient data." Nowhere in the Impact Statement, are the contradictions associated with the highly dangerous trace elements surpassed. From all appearances it is as if an author was told to write something positive, but then thought it best to insert some sort of disclaimer.

All of the following are statements in this EIS on trace elements. These substances even in minute quantities are extremely dangerous. The quantities produced by gigantic coal fired installations such as this are anything but minute. Thus the numerous distortions.

The positive statement indicating control or little danger is given first; the contradictory statement, sometimes in the same sentence is given second and underlined.

p.III-31 (No positive statement given on this page.)

"As a class, trace element contaminants, principally heavy metals have been a particular segment of concern among identified environmental pollutants, beryllium and mercury have been officially declared hazardous air pollutants with national emission standards established...Cadmium is on a proposed list and others such as selenium, vanadium and lead are under study."

p.III-33. "EPA limitations for beryllium are set at 10 grams per day (approx. 1/3 ounce) for most regulated beryllium sources."

p.III-35. "It is expected that at the Kaiparowits plant, the particulate removal system would remove the majority or particulate fluorides and the SO₂ scrubbing system would remove major quantities of the gaseous fluorides. Little information is presently available on release rates of fluorides from coal-fired power plants...Pathways by which trace elements are distributed through.

an ecosystem are complex and, in many cases, not well defined...Research to provide a more definitive assessment of the release of fluorides from coal-fired power plants and of the environmental risks of low-level fluoride pollutants is urgently needed."

- p.III-46. "Most of the trace elements would be captured with the bottom ash, fly ash and scrubber waste."

"Trace elements in coal will be released to the ecosystem when the coal is burned...The impact of long term accumulation is not well defined, and the pathways through which trace elements are distributed through an ecosystem are complex. Materials most apt to be important environmentally from long term accumulation are those not captured by emission controls, and which can have a significant influence in low concentration."

- p. IV-8. "Those systems should reduce emission of trace elements contained in fly ash, although there may be no reduction of variable trace elements."
- p.V-12. "Emission control devices planned for the proposed Kaiparowits plant would be designed to remove major amounts of sulfur dioxide (90%), particulates (99.5%) and unknown amounts of other elements including phosphorous, selenium, arsenic, mercury and fluorides."

- p.VI-3. "Air would be a receptacle for combustion products such as sulfur oxides, nitrogen oxides, particulates, trace and radioactive elements...Sulfates, nitrates, phosphorous and trace elements released to the eco-system have potential long term effects on soils, plants and animals...Bioaccumulation and biomagnification as defined for mercury could be expected with other trace elements."

Could any credibility exist on the subject for those producing a document with such totally conflicting and contradictory statements? Those responsible for this Statement are not deterred though and have produced the clincher or summary on pages III-32 and III-79. Here there are tables of predictions seemingly produced without effort giving total productions compared to "predicted release from stacks." Here fluorine which supposedly will be produced in the amount of 5800 lbs./day will have only 1/2 released or 2900 lbs./day.

Selenium and arsenic (somewhat more dangerous per unit) are assigned an even better capture rate. Only 25% will be released of each of these--200 lbs. production and 50 lbs. release for selenium, and 57 lbs. production and 14 lbs. release for arsenic. Beryllium which is even more dangerous per unit than selenium and arsenic, and for regulated sources is limited to only a total release of 1/3 of an ounce per day, here is assigned a production of 25 lbs./day, and as would be expected, an almost perfect capture of all but 1/10 lb./day. And so on, for a total of 17 elements, including mercury, where the predictor seems to have gone awry--predicting four pounds production and four pounds release in one table, and giving no production but 24 lbs./day release, 8760 lbs./year, in the other.

But most of the 17 substances are treated like cobalt. This deadly substance is assigned a production of 12 lbs./day, and as the reader has already predicted, almost absolutely perfect total capture--only .1 pound to be released.

For highly toxic substances of which "little information is presently available on release rates" (p.III-33), which "are not captured by emission controls" (p.III-48), "in systems where there may be no reduction of variable trace elements (p.IV-8), where "unknown amounts of trace elements are removed" (p.V-12), the predictors have put on an unbelievable performance. Disbelief, expressed mildly what reaction should be exhibited for both the content and the authorship of this Environmental Impact Statement. Needless to say, every figure in these tables is suspect, and under no circumstances should be thought of as factual or correct.

It appears that the writers of this EIS have been told to produce an acceptable impact; to minimize the contamination ejected from this facility and the danger associated with it, and have written what it takes to accomplish this.

With one after another of unverified, unsupported expectations, estimations, predictions, assumptions and conclusions in so many critical areas of contaminant control, one could very well wonder who really wrote this EIS and what competence they had for the job. It obviously does not have even the minimum of impartiality and expertise required of a proper Environmental Impact Statement.

CONTAINMENT OF EMISSIONS ON THE COLORADO PLATEAU

In the so-called simulation studies or models where plume dispersion is "predicted," again varied assumptions are the usual procedure. And again the general impression given is that "we will meet the standards," which is contrary to that of a significant part of the text indicating the opposite:

- p.III-22. "At the Kaiparowits site, it was necessary to study each of the potential most-critical meteorological conditions, using a predictive model."

- p.II-44. "A ground based temperature inversion occurs in the early morning hours approximately 60 percent of the time year around... Limited dispersion conditions (low mixing depth and low wind speeds) do exist during the colder months of late fall and winter with an attendant buildup of air pollutant levels." (Emphasis added.)

- p.II-49. "The 1971 studies at Mipple Bench indicated that during the winter low level surface inversions were common, often strong enough to maintain themselves throughout the day. This condition would be conducive to trapping of surface released pollutants; however, it would also tend to inhibit an elevated release of pollutants from reaching the ground." (Emphasis added.)
- On page III-24, various atmospheric conditions actions on the smokestacks' plumes is discussed starting with stable conditions.

"Stable atmospheric conditions reduce both rise of the heated plume into the atmosphere, and its vertical diffusion. On flat terrain, the pollutant diffuses slowly to ground level and maximum concentrations occur at great distances downwind after substantial horizontal diffusion. In irregular terrain, where elevations exceed plume release height, there is a potential for greater ground level concentrations, resulting from the interaction of the plume and the terrain." (Emphasis added.)

This does not sound good, and unfortunately, the three other conditions noted appear even worse:

p.III-26. "Unstable atmospheric conditions are similar to those observed during the tracer studies. A looping plume develops in which puffs may be taken up or down by convective cells in the air mass....

"Limited mixing. In 'limited mixing' conditions an elevated inversion is assumed, with the layer below being neutral or well-mixed while the atmosphere above the inversion base is stable. The inversion base generally forms a lid that effectively reduces vertical dispersion of emissions, trapping them within a mixing volume determined by the height of the inversion base and the surrounding terrain....

"Inversion breakup. In this atmospheric process the plume, initially embedded in a stable layer of air, is rapidly mixed to the ground by the convective activity beginning at ground level shortly after sunrise."

Inversions have a great effect on the persistence and concentration of pollution discharge into the air supply of the Colorado Plateau, and the previously mentioned duration of exposure and frequency of repetition are both increased by the stagnation condition associated with inversions. Such inversions can trap the atmosphere over large areas and prevent both vertical and--depending on the topography--horizontal air movement.

Most of this became obvious after the first large-scale coal burning started on the Colorado Plateau. Stating what has been known for years by those familiar with the region, James M. Eden, the Acting Regional Director for the Park Service in the Four Corners area wrote on October 20, 1969, to the National Park Service Director in Washington: "Temperature inversions are common particularly in the winter and will trap and hold pollutants emitted by the Page plant. Some of these inversions last as much as two weeks....There is evidence that the Four Corners coal-fired generating plant has contributed to air pollution over an estimated area of 100,000 square miles [total Colorado Plateau area is 120,000 square miles] in the southwestern states of New Mexico, Arizona, Colorado and Utah.... One of our concerns is that (even if better pollution control is achieved) the additional proposed and impending plant capacity may be sufficient in total, to maintain the existing unsatisfactory smog condition now created by the Fruitland plant. In other words, if one coal-fired generating plant of only 575,000 kilowatts [this was all the Four Corners plant had at the time]

can smog up large portions of four states, what will happen when new construction adds almost 11,000,000 kilowatts of additional capacity?"

The government Health, Education and Welfare Department Public Health Service "Report for Consultation on the Four Corners Air Quality Control Region," reported in Oct. 1970:

"Stable conditions--temperature inversion below 500 feet above ground level--occur during from 80 to 90 plus percent of the days annually in a broad area around Four Corners...pollutants can be carried great distances with little dilution at these times."

These statements are extremely significant. They portend great harm to the natural values, and to the health of both residents and visitors to this unique and spectacular region.

What becomes apparent from all this is that the clear air of the Plateau after being run through just one of these plants and exchanged for the approximately 249,600 tons of contaminating effluent, discharged out the stacks daily (in what are considered to be normal-size plants here) will tend to remain in the enclosure of the Plateau's boundaries. The pollution will not only be made here in huge quantities, but will take ever more concentrated residence here as each day's operation spews out large additional amounts of effluent--effluent which has never before been produced on the Colorado Plateau--or anywhere in such massive quantities.

INVISIBLE STACK EMISSIONS

According to the dictionary definition, sulfur dioxide is a heavy colorless, invisible gas produced by the burning of sulfur, and which readily combines with oxygen to form the fuming liquid sulfur trioxide. Also, "Sulfuric acid is made commercially by absorbing sulfur trioxide in water."

Because sulfur dioxide is a colorless gas, as invisible as the air itself, it, together with most of the nitrogen oxides cannot be seen as they emerge from the stack. Since the trioxides are a fuming liquid or mist, are somewhat visible, and start to form even as the flue gases make their way through the collector system, it is a common practice to slightly heat the stack gases beyond the dew point so as to cause any visible gaseous plume to disappear. Why, days later, there is a pall of ugly-yellow-grayish pollution hanging over thousands of square miles from just the effluent discharge of a single plant is explained somewhat by the Los Angeles Times in a five-page story June 13, 1971:

"Emissions of particulate matter are measured by total weight. The larger particles are easier to collect and naturally fall out of the air more rapidly. The lighter particles circulate in the atmosphere as would a gas--in other words, almost forever--while ever so slightly darkening the sky by their presence."

"And what you won't see emerging from the stacks of the projected six plants will be 2,160 tons of invisible sulfur dioxide per day, and between 850 and 1,300 tons of oxides of nitrogen per day. Sulfur dioxide and oxides of nitrogen have the added feature of turning into sulfuric and nitric acid when further oxidized and united with moisture in the air. And...

"Yet another hidden feature in sulfur dioxide is that once transformed to sulfuric acid vapor it becomes visible as a gray-white haze. Thus an innocent-looking trickle of visible smoke issuing from a power plant, accompanied by hundreds of tons of invisible sulfur dioxide will travel downwind almost unnoticed but appear two or three days later as a smudge covering thousands of square miles....

"And still one more catch: sulfur dioxide is far more difficult to control than particulate matter, and oxides of nitrogen, more difficult yet. The cost of a really thorough job of cleaning up the air could be astronomical--possibly prohibitive."

TALL STACKS AND EMISSIONS

On page IV-7 in discussing "The participants proposal to reduce emissions from the generating station," five items are listed. The first has to do with burning low sulfur Kaiparowits Plateau coal. The third, fourth and fifth are concerned with devices--or non-devices--for the control of particulates, sulfur oxides, and nitrogen oxides respectively; that which has already been addressed here in detail. The second states: "Install stacks of a height that would provide the most efficient dispersion of the gases."

Here again, another erroneous, totally false and misleading contention is made, giving the impression that tall smokestacks can reduce the emissions of this plant.

"Smokestacks possess no magic power to eliminate pollutants," declares the U.S. Public Health Service publication "Tall Stacks." "They do not reduce by one gram the total amount of pollution released to the atmosphere. They distribute it in a different way then would be true of a low level source, but receptors (people, etc.) at a great distance from a stack will receive substantially the same concentration no matter what the source height."

To put it simply, the same amount of pollution comes out one end of a stack as is put in the other regardless of whether the stack is seven feet high or 770 feet high. What high stacks do accomplish is to spread pollution away from the polluter on to his neighbors miles away. How does the contamination finally find its way off the Plateau? The answer: only when the wind blows strong enough to push it into an adjacent region.

On page VI-4, it is stated that there is little likelihood the

pollution from the various giant power producing installations on the Four Corners Plateau will interact, or come together, even though for one the 2,310,000 kilowatt Page plant would be only 35 miles away. This is exactly contrary to the point for having tall stacks: to disperse the pollution over a region of many many square miles so as not to dangerously contaminate or confine a health hazard to any one area, and "to meet the standards."

On one hand the writers of this Statement contend that the pollutants will be dispersed over a wide area and on the other they wish the reader to believe that the contamination will spread itself around in just the right proportions over a defined area; that each plant, of which one is planned about every 25 miles in the heart of this canyon region, and each massive addition to the pollution load, will be kept in isolation from all the others. Even more so the predominant impression one gets as he reads page after voluminous page interspersed between important details, is that the contaminating effluent will just tend to disappear or evaporate, and stack height makes little difference.

In truth it does make little difference. Because the Colorado Plateau is surrounded on all sides by higher relief, it is, in totality, a basin or sink itself for any large scale pollution produced on it; and regardless of whether a stack is 500 or 700 feet high the combination of highly dangerous substances - that no technology has ever come close to controlling - will not dissolve away. They will take over more concentrated residence here as each succeeding plant adds its load of ever more intolerable filth and gaseous effluent to the region's atmosphere.

On page III-9 it is stated that "A substantial impact on recreational resources could result from visual air pollution. . . . A malfunction could cause visual air pollution in the major national parks in the vicinity." This plant does not need to malfunction to cause visual air pollution. Every such facility in the region anywhere close to this size has caused visual air pollution consistently with everyday operation. The conclusion can be drawn that operation of such facilities anywhere in this uniquely scenic area is a malfunction.

The Colorado Plateau is a distinct geological province covering parts of four states. It is bounded by the Uinta Mountains on the north, the Rocky Mountains on the east, the Mogollon Rim of Arizona on the south and the high rim of the uplift bordering the Grand Canyon on the west. In 1971, after both the Four Corners (2,075,000 kilowatts) and Mohave (1,500,000 kilowatts) plants effects were causing increasing distress, the Wall St. Journal reported on April 13 that pollution from the Four Corners station in New Mexico had been tracked by plane into the Grand Canyon 180 miles away; and a Denver Post story of May 27 stated "the pall from the Four Corners plant sometimes drifts as far away as Los Alamos, 150 miles to the southeast, and when southern winds blow, the ash comes into Mesa Verde National Park and the Durango Cortez area." Now, five large power exporting facilities are operating on the Colorado Plateau including the latest at Page, Arizona (to be 2,300,000 kilowatts), directly across the Colorado River and the Glen Canyon National Recreation Area from the proposed Kaiparowits.

UNSPEAKABLE ACT OF VANDALISM

This, the Kaiparowits, will be the largest coal burning powerplant ever attempted and with a consumption of 33,000 tons per day will burn more coal at a single location than has ever before been burned in the world's history.

There could hardly be a worse location for a massively polluting plant such as this. It is in the center - directly in the heart - of an incredibly scenic and unique national and international natural wonder. It is in an area of more unique geology than any place on earth. No where in the world is this region duplicated.

Just to the south across the Colorado River is the Rainbow Bridge area, which contains the largest natural bridge in the world; and remarkable mazes of redrock canyons; also Navaho National Monument, an amazing combination of three of the best preserved canyon cliff dwellings ever discovered; also Glen Canyon National Recreation Area, Marble Canyon National Monument and the Grand Canyon, the furthest of these less than 60 miles away.

To the west is Zion National Park, Cedar Breaks National Monument and Bryce Canyon National Park, only 25 miles away.

To the north and east are Canyonlands National Park, Arches National Park, Natural Bridges National Monument, and Capital Reef National Park which is also less than 60 miles away. There exists no more extensive system of canyons and redrock formations than right here. This is the most concentrated area of National Parks in the world. No state even approaches the National Park entities of Southern Utah. To zone these most beautiful and wonderful works of nature "industrial" is an unspeakable act of vandalism. It should never be permitted, anywhere than it would be permitted on the lawn of the White House or the grounds of the Washington Monument.

TURN AREA INTO RUHR

On page III-11 the statement is made that "A small coalition of resident and non-resident conservationists would be disappointed if the project were approved." Its tragic and unbelievable how the authors of this Statement understate and downplay the effects of this, the largest coal burning yet conceived, and the tremendous opposition to it by large numbers of people. One gets the impression that it would have to be utility company sympathizers or personnel on loan from these power firms who wrote this particular sentence. Has the writer of this paragraph ever attended any of the hearings on these operations such as the aforementioned ones conducted by the Senate? If he had, he could not with any honesty make such a statement. Here, many had their first opportunity to comment on this tremendous burning of coal and the production of "clean" electricity here for the benefit of megalopolises 400 to 600

miles away; hearings on making this "a National Sacrifice Area for the production of clean electricity and dirty air. The electricity is exported to Los Angeles, Phoenix and other points west, the dirty air stays," as Indian author Alvin Josephy commented.

At these hearings and others there have been literally thousands of negative replies to construction of these power plants. The negative replies, in fact, both in speeches and in writing far outnumbered those approving such operations. Almost in totality the only supporters were power company officials and their consultants and some political officials. Very few of the public did so and a single petition by a group of women living north of the Four Corners plant was many times more individuals than all of the approving responses to the plants combined. And with an even more extensive knowledge now of this most remarkable region by larger numbers of people, the opposition to their plans to turn this area into a Ruhr is greater now than it ever has been.

This facility, if built, will be the first for southern Utah and will open the way for large numbers of others. A different consortium has been pressing very hard for an equally large plant just east of Capital Reef National Park; another for a 3,000,000 kilowatt plant less than 20 miles north of the Kaiparowits. In fact, right now at the State Engineers office in Salt Lake City a minimum of 54 water right applications have been filed for at least 24 powerplant locations with water to be diverted from the Virgin River, Huntington Creek, White River and tributaries, Paria River, Escalante River, San Juan River, Lake Powell, San Rafael River, Muddy Creek, Uintah River, Ferron Creek, Green River, Boulder Creek, Fremont River and tributaries, up-to-now unnamed underground rivers or streams and at least 252 wells or well clusters. One such cluster by Utah Construction and Mining Co. involves 192 wells spread out over 63 sections (square miles). Another is for 173 wells. Some applications are for plants of over 10,000,000 kilowatts.

Terrifying? More and more a commitment to dirty industry? This area the coal incinerator and airborne ash and gaseous depository of the Southwest? To most citizens--"Yes." To some of those in political control and the large industrial-mining interests backing them--"It smells like money to us."

The process here of getting a 3,000,000 kilowatt plant cleared for Four Mile Bench on the Kaiparowits Plateau is just the opening wedge. Increasing the plant size to 6,000,000 and 8,000,000 kilowatts, as has been planned for many years, close to mines spread out on the Kaiparowits Plateau from end to end, would be much easier after one plant was already in existence. Any environmental statement then would not have to consider a new town, transmission line corridors or myriad other details. It would mostly consist of additions to that which would already exist.

IMPOSSIBLE TO EXCEED STANDARDS

Much thought has already been given to turning the Kaiparowits Plateau area into a coal burning-mining park. As is stated on page VIII-222:

"The first increment would be built at right angles to the proposed 3000 mw. The addition of two more increments, for a total site capacity of 12,000 mw, could be built by completing the square. Additional increments could likewise be added. . . . Based on this evaluation the participants found that up to 25,000 mw capacity could be built at the site without significant danger of exceeding the limiting three hour sulfur dioxide standard. Compliance with remaining standards at higher megawatt capacities could also be accomplished since relation between expected ground level concentrations and the standards would be better than the limiting factor of the 24 hour SO₂ standard."

Anyone who is under any illusions about how protective standards are, had better dispose of those illusions forthwith. Not only can one and one half Four Corners powerplants be built right next to an individual and not exceed the standards but some twelve four corners plants and more can be constructed completely surrounding a site and still not exceed the standards. The fact is that as many of the largest powerplants possible could be built on every square inch of land in Utah and the emission standards as given on page III-20 would not, or could not, be exceeded. They would not be exceeded even if built on every square foot of land in the U.S. These are "restrictive" standards?

Given below are the ambient standards, or what the condition is or the components are of a sample of air, taken from a particular location, over a given time period. Concerning these, the same individual could very well have been responsible for the concept and formulation of both types as effective as either is here in abating or halting pollution or stopping or reducing a health hazard, regardless of how serious. As stated by John Bartlett, state chairman of the New Mexico Citizens for Clean Air and Water:

"The power industry claims studies show their emissions will cause no ambient air standards to be exceeded. This same claim can be made (and probably has) for every pollution source - large or small - in the nation. To prove any one existing source is violating ambient air standards, much less causing health problems, borders on the impossible."

(In micrograms per cubic meter ug/m ³)	CLASS I AREA	CLASS II AREA	FEDERAL STANDARD
	INCREASE ALLOWED	INCREASE ALLOWED	
PARTICULATES			
24 Hour Standard	10	30	260
Annual Standard	5	10	75
SULFUR OXIDES			
3 Hour Standard	25	700	1300
24 Hour Standard	5	100	365
Annual Standard	2	15	80

Using figures given in this Statement, 101.7 tons per hour - 2440 tons per day - of flyash will be produced by the facility. 537 tons of sulfur oxides a day will be produced using "worst" sulfur coal and 347 tons using what is called average coal. The figure given for nitrogen oxides is 370 tons. The reader can supply his or her own figures for what will be trapped.

Looking at the table and comparing a Class II area pollution increase to Class I for a 24 hour period, a 20 times more increase of sulfur oxides would be allowed (considering any enforcement of such standards is possible and would be strictly carried out - a most questionable assumption). For a three hour period the allowable increase is 28 times more sulfur oxides than if the area were declared Class I.

Comparing EPA sulfur oxide standards for ambient air and the Class I allowable increase, a fortyfold increase is allowed annually over unpolluted air (supposedly this is the air now in the canyon country). 73 times more sulfur oxides are allowed every 24 hours and 52 times more in any 3 hour period. For particulates, 15 times more of this matter is allowed annually than over pristine air, and 26 times more would be allowed in a 24 hour period.

If one can assume as the present powerplant operators and these participants wish us to that there is no perceptible broadcast of their effluent over the Colorado Plateau, than under Federal standards an average increase of 50 times more sulfur oxides would be allowed hourly, daily and yearly than would be permitted if this was a Class I area with minimal atmospheric pollution; for particulates an average of 20 times more contamination annually and daily would be allowed.

With National Parks, Monuments, Recreation Areas, Forests and canyons completely surrounding the Kaiparowits site, should this area be zoned anything less than Class I? It is zoned Class II.

NO LIMIT

GONE UP IN SMOKE

As the quote of page VIII-222 on expected ground concentrations and the standards indicates there obviously is no limit to how many - millions of kilowatts - plants could be built on the Kaiparowits Plateau and everywhere else in this canyon region and still not exceed the standards. Once the area has been "zoned industrial" by action of power company

and political officials, once additional powerplant after powerplant has been built here, once more and more large scale polluting industries seeking an area having minimal or non-existent pollution control have made this their home we can all forget about the redrock canyons and formations, the spectacular and unique beauty here, the 30 National Parks, Monuments and Recreation Areas. As Richard Register, a writer returning to his home town of Santa Fe, N.M., said some five years ago when only the Four Corners and Mohave were spreading their pall over the Colorado Plateau:

"What's happened to the crystalline skies and healthy air? Its gone! Gone to the steam shovels, furnaces, turbines and generators, gone to Los Angeles in 500,000 volt lines and gone up in thousands of tons of smoke."

Interspersed between the massive amount of trivia and repetition in this 2600 page Statement are some sobering thoughts that are especially significant and most likely highly accurate considering relevant aspects of the plants presently in operation. On page VI-2

"Major emphasis and discussion of change is centered around the Kaiparowits Plateau area. It would be transformed from a relatively undeveloped ranching oriented area into an industrialized region with coal mining and subsequent electrical energy production as the dominant industrial and financial foundation. . . . Air would be a receptacle for combustion products such as sulfur oxides, nitrogen oxides, particulates (including fly ash, sulfates and nitrates), trace elements, radioactive elements and methane. The exceptionally high quality of the atmosphere, as it now exists would be committed to quality degradation should plant development begin."

And on page VII-6, "This project would encourage additional development in the area . . . These in turn call for commitment of additional lands, and people are locked into expanding social systems that are practically irreversible. The commitment to use resources in the proposed manner would result in an irreversible commitment to a new way of life and lifestyle for the area surrounding the Kaiparowits Plateau."

SUMMARY

The environmental impacts of this installation will be so great, so dangerous to human and other life, so destructive of natural, scenic and atmospheric values, and of such permanent duration, that this facility, or any other like it, should never be allowed anywhere on the Colorado Plateau, now or in the future.

THE UNIVERSITY OF UTAH
SALT LAKE CITY 84112

COLLEGE OF PHARMACY
DEPARTMENT OF
BIOPHARMACEUTICAL SCIENCES

November 14, 1975

Environmental Project Staff
135 South State
Salt Lake City, Utah 84111

Gentlemen;

I would like to have this letter included in the public hearing record concerning the proposed Kaiparowits Power Plant and the associated environmental impact statement.

As a lifetime resident of Utah, and a professional chemist working in the field of cancer research at the University of Utah, I am compelled to comment on the proposed Kaiparowits Power Project.

A very recently published 402 page report entitled "Effects of Chronic Exposure To Low-level Pollutants In The Environment" prepared by the Library of Congress' Congressional Research Services for the House Subcommittee on the Environment and the Atmosphere states that repeated doses of common place pollutants as fumes in the air are "increasing risks of cancer, heart disease and genetic mutations." The report lists some of the pollutants which are primarily responsible for this increase. Many of them are going to be produced by the Kaiparowits plant, particularly sulfur dioxide and mercury, which affects the central nervous system.

The environmental impact statement fails to include enough information about the specific effects of the pollutants upon the health of the people living within a specified radius of the plant. I recommend that the impact statement be amended to include more of the kind of information found in the above mentioned report. And that at the very least, a copy of the report be included in the impact statement.

My fellow scientists in the field of cancer research have known for years that a single exposure to the pollutants listed in this report are not harmful, but repeated doses or constant exposure to minute amounts of pollutants in the air can build up toxic substances in an individual, increasing the chance of developing cancer or other illness or other damaging effects. Problems like the insecticide DDT, mercury in fish, and cigarette smoking are prime examples. The report also states, "While the advent of many new drugs has permitted the physician to gain control over many diseases, particularly many of the so-called 'killer' respiratory diseases, new types of respiratory disease,

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not caused by infectious organisms but as a result of exposure to environmental contaminants have assumed a significant importance." The study also reported that environmental problems may account for as much as 70 percent to 90 percent of the causes of cancer, and are also responsible for some heart diseases.

Since the environmental impact statement clearly indicates that massive amounts of pollutants, sulfur dioxide, nitrogen oxides, and mercury, etc. will be emitted into the air from the Kaiparowits plant, plans for its construction should be terminated immediately.

If this power plant is completed here, there is no doubt that the people of my state will suffer; and they will suffer from an increased incidence of cancer, lung and heart disease, and perhaps neurological and genetic damage. No supposed economic benefit is worth the sacrifice of our clean air and our health. The quality of life in Utah must not be sacrificed so that others in another state may have cheap electrical power. If they want that power, let us accept the alternative of locating the generating plants in Southern California, since that is where most of the power will go, and sending them the coal by slurry pipeline.

Another very major consideration for locating the plant in another area is the proximity of the Kaiparowits plant to five National Parks and other state and local recreation areas. Particularly the Grand Canyon and Zions and Bryce and Capitol Reef National Park. These are areas of great and grand scenic vistas unequalled anywhere in the world. Any degradation of the clean air in these areas would be a tragedy as well as a sin and should absolutely not be allowed under any circumstances!

For these and numerous other reasons pointed out plainly in the environmental impact statement, the Kaiparowits power plant should never be built in Utah. The impact is far to great. Our health and our children's health demand nothing less.

Sincerely,

Steven J. Manning
Elva R. Manning

Steven J. Manning
Elva R. Manning

Utah environment center

1600 Judge Building, Salt Lake City, Utah 84111 533-0591

November 13, 1975

Mr. Paul Howard, State Director
Bureau of Land Management
125 South State
Salt Lake City, Utah 84111

Dear Mr. Howard:

In response to the draft Environmental Impact Statement on the Kaiparowits Power Project, as produced by the BLM Kaiparowits Study Team, the Utah Environment Center submits the following comments:

In general, the information contained in all five volumes of the EIS is good. Various areas of information, however, were inadequately disseminated to the reviewer, possibly for the reason that BLM had a difficult time obtaining the information from other sources or adequate studies had not yet been conducted. These areas are 1) air quality impact on the area from other power projects, 2) visibility impact on the region, 3) impact on under-ground water systems from sewage and waste disposal and who retained responsibility after the project is no longer needed, 4) impact on surrounding national parks and recreation areas, consequently, impact on tourist trade in the area, 5) what public utility commission will retain responsibility for the transmission system, 6) protection to raptors from electrocution on transmission towers, 7) lack of alternatives to plant sit or size, and 8) best use of water and coal resource - alternatives.

It is also our suggestion that BLM establish an interagency study team, allowing all federal land management agencies in Utah the benefit of sharing available study progress and results, greatly reducing the current situation of little communication between decision makers. The energy development era will be a long-range situation in Utah. If such an interagency team were established at present, information would have been shared as to the progress of the National Park Service's air quality study on the national parks in Utah, and that the Lake Powell Research Project is finalizing air quality material for release shortly, that was lacking when the draft EIS was released.

The UEC Board of Trustees (Attachment #1) passed an Energy Policy at their regular meeting, Oct. 27, 1975, which calls for a regional assessment of power projects for this area and suggests that if power projects are given a final approval, they be scaled down to a smaller size, surveying impacts per each unit. A full copy of the Policy is attached, (Attachment #2)

We appreciate this opportunity to share our views.

Sincerely,

Jan Johnson
Jan Johnson, Executive Director
Enclosures

Board of Directors

Mrs. Carolyn Caine - President

Consultant, Natl. Endowment of the Arts, federal & state partnership; Co-chairman, Festival of Arts for Young Women's Advy Council, Women's Resource Center, Univ. of Utah; member Sister Cities Committee, Chamber of Commerce; board member, Black Oak Mining & Milling Co.; former member, City & County Mental Health Advy Council.

Mrs. Eugene (Lloyd) Bliss, Vice Pres.
Serves on Governor appointed Judicial Systems Task Comen, Third Judicial Dist. Selection Comen; Board of Directors, Utah State Institute of Fine Arts; past-pres., local & state chapter, League of Women Voters, serving currently on Natural Resources and Water Pollution Control Committee for League.

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Lee Kapaloski, Exec. Member-At-Large
Dept. of Interior, Power Plant Siting Unit; State environmental coordinator, Chairman (past), State Environmental Coordinating Committee; Salt Lake Canyon Dist. Planning Comen; member, Jordan River Water Quality Advisory Committee; consultant, National Science Foundation, Rocky Mtn. Environmental Research Project; currently enrolled, Univ. of Utah, PhD-JD degree, environmental law & planning.

Mrs. John (Stephanie) Churchill
Director of Utah Heritage Foundation; member, Bicentennial Committee, Utah.

Mrs. Carl (Millie) Ehrman
President, Council On Utah Resources; Legislative Chairman, Uinta Chapter, Sierra Club;

Dr. Val Finlayson
Research engineer, Utah Power & Light; Chairman, Energy Comen of Utah, State Council of Science & Technology;

Harit Wixom Editor, Utah Outdoors; writer for Rocky Mtn. Field & Stream; Western Outdoors, Provo River Parkway Citizens Comm., free-lance writer, outdoor resource.

(Dr. Finlayson, Cont'd)

Chairman, Electric Power Research Institute, Solar & Geothermal subcommittee; Chairman, Electric Power Institute, Fusion Reactor Design steering committee; Vice-Chairman, Environmental Comm., Salt Lake Chamber of Commerce; member, Atomic Energy Commission, adv. board.

Professor Jefferson Fordham
Professor of Law, Univ. of Utah; was Dean, College of Law, Ohio State; was Dean, Univ. of Pennsylvania Law School; member, American Bar Assoc., four states; past president, Assoc. of Law Schools; member, Council of American Law Institute.

Lloyd Gordon
Director and Editor of ISSUE1 (Interested In Saving Southern Utah Env.); Radar technician, Fed. Aviation Admin; has worked in aerospace research.

Dr. Harold B. Lamb
General Surgeon; Conservation Chairman, Audubon Society; Medical Director, Utah Power & Light; State Chairman, Environmental Health Commission.

George D. Melling, Jr.
Attorney, Fabian & Ciendenin; Board of Trustees, Friends of the Children's Center; Environmental Control Comm., Utah State Bar Assoc.

Owen Olpin
Farr Professor of Law, Univ. of Utah, College of Law; adjunct Professor, College of Natural Resources, Utah St. Univ.; board member for following: Utah Lung Assoc.; Natural Resources Defense Council; Center for Law in Public Trust; Rocky Mtn. Mining Law Foundation; Chairman, Env. Control Comm., Utah Bar Assoc., public member; Administration Conf. of U.S.; vice-chairman, Env. Comm. of Natural Resources section, Amer. Bar Assoc.

Robert Redford
Actor; Board member, Env. Defense Fund, Natural Resources Defense Council, Planned Parenthood.

Draft of Statement for Consideration
by the Board of Directors of the
Utah Environmental Center

Prepared
by
Val Finlayson
Jefferson B. Fordham
and
Lee Kapaloski

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The board is deeply concerned about the potential impact of energy and other large-scale development in Southern Utah. Because of this concern and the need to make known the general disposition of the Board of Directors we are making this statement.

1. We perceive the subject not simply in terms of the felt energy needs of this generation but in the perspective of the human role as trustee for the total natural order and particularly for whatever forms of life may exist on this planet now and hereafter.

Those who have the responsibility and authority to determine the use of precious natural resources must base their decisions on the interests of both the present and future generations. It is only in this fashion that the responsibility of trusteeship can be fulfilled. We eschew any thought that our genus is the be-all and end-all of the earth. We are but one element of an extremely complex and ordered natural system, our environment.

2. The Southern Utah or Colorado Plateau must be considered as a unique, priceless, and irreplaceable national and natural asset, to be zealously guarded as such. It is a region endowed both with great aesthetic and recreational resources and significant energy and mineral resources. Any contemplated use, development, or modification of any of these resources must be assessed against their total regional impact rather than singly and in an isolated fashion.

3. We assert that there is a heavy burden upon those who would commit any part of the area to large-scale development, such as generation of electricity, or development of other energy and mineral resources, to demonstrate

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that what they would do would be compatible with the natural order of land, air, water, flora and fauna. In other words, all decisions regarding development must be based upon the presumption that the natural order is in balance and any disruption must be to serve a compelling public interest and not adversely disruptive to the preservation of the order.

4. At a time when there is very active consideration of energy development in the region, notably in the Kaiparowits area, concern for the larger public interest is heightened. Broad public and community values must be guiding influences for all decisions of local, regional or national impact. No longer can the irreversible and irretrievable commitments be made without such equitable reference to all affected values.

5. What we stress most urgently is that there should be a regional assessment of the entire Colorado Plateau before any decision as to major development is made. There should be allowance in the interim only for extremely urgent and proven need and then only in a staged and cautious manner. Economic efficiency is relevant to this assessment of course; however, without comprehensive regional assessments, well-grounded judgments cannot be made as to where, if in any part of the region, development should take place.

In any case there must be a regionwide determination of the tolerance thresholds of that environment above which no development should be allowed. The determinations of these thresholds should be based on the overall long-term public welfare and not the short-term private sector criteria.

6. It is very important that cautious staging of any allowed development be considered rather than absolute approval of total development. All environmental impacts cannot be determined conclusively in advance of development. Prudence, thus, suggests that development, if undertaken, be done in stages, that is, initially smaller units, rather than on a maximum scale at the outset.



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CANYONLANDS ENVIRONMENTAL EDUCATION CENTER

BOX 177 - MOAB, UTAH 84532 PHONE (after April 1976) 801-259-7898
Helping the Scenery Come Alive For You
(Utah Non-Profit Corporation Status Pending)

STAFF:

Ann Bodette David H. Loope
Scholastic Specialist Interpreter
W. L. "Tuck" Forsythe, Ph. D.
Director

CONSULTANTS:

Kay Forsythe
Walter Loope
Owen Severance

HOWDY MR. HOWARD, BLM, 13 Nov 75
LOTS OF JOBS AROUND MOAB DEPEND
ON OUR RELATIVELY CLEAN AIR.

OUR TOUR + NATL PARK ASSOCIATED
BUSINESSES VIEW CLEAN AIR AS
A SALABLE COMMODITY.

PLEASE TRY TO CLEAN UP THE
STACK EMISSIONS OF EXISTING
POWER PLANTS + MAKE KAIFARWITS
A MODEL OF HOW WE CAN KEEP
OUR CLEAN SKY + OUR RELATED
JOBS.

THANKS,

W. L. "Tuck" Forsythe
Director

UTAH COMMISSION

FOR

MINISTRY IN HIGHER EDUCATION

MEMBER
DENOMINATIONS
AMERICAN BAPTIST CHURCHES
CHRISTIAN CHURCH (DISCIPLES)
EPISCOPAL CHURCH
UNITED CHURCH OF CHRIST
UNITED METHODIST CHURCH
UNITED PRESBYTERIAN CHURCH

RELATED TO
UTAH COUNCIL OF CHURCHES

232 UNIVERSITY STREET
SALT LAKE CITY, UTAH 84102
(801) 364-4357

November 14, 1975

Mr. Paul Howard, State Director
Bureau of Land Management
125 So. State St.
Salt Lake City, Utah 84111

Dear Mr. Howard:

I am the Co-ordinator-Strategist for the above-named agency of the Churches listed, but I am writing for myself and not in an official capacity. However, I am an active citizen when it comes to public issues and have just undertaken to assemble a research task force on Land Use, Agency and Mineral Extraction Impacts, and Quality of Life in Utah for my employer and the Utah Inter-church Coalition. A big task, I realize!

My purpose now is to express opposition to an immediate decision to proceed with the McQuade power plant project. It seems to me that the public consideration is only now reaching the desirable level, even though the project has been under consideration for some time. There are a number of considerations.

First, recognizing that Utah is part of the nation and cannot and ought not to try to go it alone, in this project really for the good of Utah or does it make us a "national sacrifice area" or a colony of California and Arizona, to be sucked dry and then forgotten when we are no longer of use? We should have a severance tax as surrounding states do so that we get some benefit from our non-renewable resources. If our budget is in good shape right now, then we could lower other taxes. How firm are estimates of the California demand? A representative of a major energy(oil) company told me at the public (domestic) policy forum in Denver last month that he agreed with my guess that they are exaggerated, being built up by the consortia which stand to profit by the development. The American people will readily learn to conserve and cut down the rate of increase of power demand, especially if the area concerned must host the plants. Why should we in Utah suffer the air and other deterioration - why not ship the coal to Arizona and California. I am not a one-issue person, concerned only with Southern Utah scenery, but that is one consideration.

Second, have we really considered the social-cultural impact of California's - and those planned to follow? The population influx - the first phase of construction workers, other of miners and operators - will be people of different values and needs and wants. We need a job training program we don't get how to secure any of these jobs for Utah. There will be social problems and cultural clashes, first in Southern Utah and then along the Wasatch Front, as these Texas, California,

and Appalachian folk come in. Mind you, I'm not opposed to those people. We just are not ready for them. The social services infrastructure does not exist and I see little evidence that it is being built.

Third is water. Is this the best use of the source water Utah has available? I hear that agricultural communities are already suffering from land speculation related to power development in Esmeralda County and elsewhere. We need food production and we need those stable communities. Once they are destroyed, it will be very difficult to regain them. Let's send the coal that California and Arizona really need to them and let them process it with their own water allocations.

These social and long range economic considerations should be plugged into environmental impact studies at the beginning and taken into account, with regional considerations as well as state considerations taken into the picture. The relatively short range economic factors are not enough. We recognize that the decisions are complex and that we in the Churches have a job to do as citizens and consumers and to the extent we are able as holders of values, but we believe part of our responsibility is to speak out now if we haven't before.

Very sincerely,

John H. Wade

JW

cc. Sen. Moss
Sen. Garn
Rep. Howe

P.S. One other unsettled area is health hazards from discharges from the plant - and others planned. Are we going to have the hazards that have developed further southeast in the Cornudas area, especially in New Mexico - as I understand what's happened there?

IX-737





UTAH ASSOCIATION OF COUNTIES

10 WEST BROADWAY, SUITE 311
Salt Lake City, Utah 84101
Phones: 359-3241 and 359-3032
JACK E. CHRISTENSEN, Executive Director

November 14, 1975

Secretary of Interior
Bureau of Land Management
Utah Office
Federal Building
Salt Lake City, Utah

Dear Mr. Secretary:

The county governments of the State of Utah have become increasingly concerned over the delays in obtaining a favorable decision relative to the proposed Kaiparowits Powers Project in Kane County, Utah. Please be advised that the Utah Association of Counties has in the past and continues to support the development of this project. We urge favorable action as soon as possible. We favor development of the states natural resources and increased electrical power generation in the state. We favor the Kaiparowits Power Project.

Yours truly,



Jack E. Christensen
Executive Director

JEC/jdc

IX-738

FEDERATION OF WESTERN OUTDOOR CLUBS

Established in 1932 for Mutual Service and for the promotion of the Proper Use, Enjoyment and Protection of America's Woods, Wildlife and Outdoor Recreation Resources.

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1975 - 1976

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ARTHUR B. JOHNSON
California Vice President
201 E. ASHDALE ST.
WEST COVINA, CALIF. 91790
(213) 332-9634



Nov. 13, 1975

Re:
Kaiparowits Power Project

Mr. Paul L. Howard, State Director
Utah State Office,
Bureau of Land Management,
125 South State Street,
Salt Lake City, Utah 84111.

Dear Mr. Howard:

The attached seven pages are Complementary Comments to those made orally by me at the Public Hearing on September 19, 1975 at San Bernardino, California.

Together they voice the opposition of the Federation of Western Outdoor Clubs to the Kaiparowits Power Project as set forth in our resolution approved at our 1975 Annual Convention. The Resolution was read into the record September 19 and a written copy was handed to the hearing clerk.

Sincerely yours,

COMPLEMENTARY COMMENTS

of the
FEDERATION OF WESTERN OUTDOOR CLUBS
to the oral remarks made at
San Bernardino, California, Sept. 19, 1975.

As stated at San Bernardino, water and not power is, and will be, the determining factor limiting the population growth in the consumer use areas of the Southern California Edison and the San Diego Gas and Electric Companies. Therefore the ultimate limit to electric power use is established by water, not the extrapolated hopes of electric producers.

Several decades ago the water use exceeded the natural supply to the coastal basins of Southern California. As early as 1913 Los Angeles City completed a 233 mile aqueduct to import water from the eastern Sierra Nevada drainage into the Owens River Basin to Los Angeles. By 1925 it was recognized that additional water would be needed by the Los Angeles Metropolitan Area and surveys were started looking towards additional importation into Southern California from the Colorado River.

By the early 1930's work was under way on another, four times greater capacity, 242 mile aqueduct. The water would need to be lifted nearly a third of a mile in elevation. To provide the power to pump that water 36% of the power capacity at Boulder (Hoover) Dam was allotted to the exclusive use of the aqueduct. Also, in the All-American Canal Act an allotment of water was made to the San Diego area to supply the water needs of several hundred thousands of people.

By the 1950's it became apparent more water was needed for Southern California. As a result the California Aqueduct was constructed. Its capacity is about equal to the natural water available to Southern California. Also, during its construction, the City of Los Angeles paralleled the original with a "double barrel" to nearly double its capacity. The U. S. Supreme Court, in a monumental decision, on the division of the Colorado River waters shot down the Colorado River as a source of water to most of the Southern California population.

As vital as water is to Southern Californians, there is also a limit to what the people will pay for its benefits. At the Nov. 4, 1975 election the voters of 12 communities in the water hungry Romona (Valley) area voted down by a 3 to 2 majority a bond issue to provide a water main system to bring the new California Aqueduct water to their respective distribution facilities.

If the people will not buy water, they most certainly will not buy the more costly, but not more necessary, electric energy. The water available to the people of Southern California is definite and finite. Therefore there is a definite limit to the possible population of Southern California and a correlary limit to their electric energy needs.

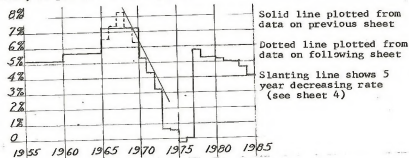
It is not necessary to reiterate the oral statement of the Federation made at the San Bernardino hearing concerning the fallaciousness of the indefinite extrapolation of a compound curve, however the example cited definitely illustrates that principle.

The Federation questions the veracity of Figure 17 (page 1-35) of the draft Environmental Impact Statement, (E.I.S.). The graph shows an increasing per capita consumption through 1973, a flat rate for 1974, a slight increase for 1975 and a flat rate for 1976 and 1977, then a sudden unexplained increase in per capita consumption beginning in January 1978 and extrapolated into the future. No explanation nor rationale is given for why the flat curve from 1974 through 1977 after leveling off from a previous increasing use rate should suddenly jump from a rate much less than $\frac{1}{2}$ percent to a rate of nearly 6% (5.79). Figure 15 (page 1-33) shows the increase per period of per capita use, (in the right hand column). If another column were added showing the annual percentage difference from one period to the next, we will get 5.14% annually for 1955 to 1960. Continuing, the following are the respective annual percentages; 5.66, 7.25, 5.28, 4.29, 3.18, 0.65, 0.55, -0.27, +0.04, 5.79, 5.22, 5.24, 5.14, 4.99, 4.93, 4.59, and 4.01 for 1985 over 1984. The average annual rate of increase for the 1965 to 1970 period is 7.25%.

(2)

That high rate of increase occurred during a period when electric utilities, including the City of Los Angeles, indulged in extensive advertizing and the promotion of the "all electric home". It was also during an extreme building boom with builders competing with each other in promoting and producing all manner of labor saving electrically powered devices and tools for the housewife and the home owner. That half a decade also ended with the people's awakening awareness to environmental decay and the passage of the NEPA legislation, which has produced this E.I.S.

Inspection of the per capita use data in Fig. 15 demonstrates a drastic reversal of per capita use rate after 1970. In 1971 the rate of increase dropped from the previous 5 year average rate of 7.25% to only 5.28%. During 1972 the ^{rate} dropped another percentage point to 4.29. Again in 1973 the rate dropped to only 3.18%. 1973 ended with the "Energy Crunch" of December. The next year, 1974, the rate dropped drastically to only a 0.65% increase. The year 1975 is not yet complete, but Fig. 15 anticipates a small further decline. Plotting the per capita use data set forth above, we get the following graph.



It is true that the 1973-74 drop was an aberration. An aberration caused by a shortage of a necessary ingredient, fuel. However the 1970 to 1973 drop was not an aberration. It was a true continuing change in general public use pattern. If we back up into the 1965-1970 period with the 1970-73 1% drop rate to a peak and then back down to the 5.66% average rate of the previous period we get the following.

(3)

Per Capita Rate of Increase Data

Year	Percent	Difference
1973	3.18	1.11
1972	4.29	.99
1971	5.28	1.00
1970	6.28	1.00
1969	7.28	1.00
1968	8.28	.88
1967	7.40	.87
1966	6.53	.87
1965	5.66	

If we average the assumed 1966 - 1970 rates above we get 7.15% which is is reasonably close to the 7.25% average annual rate computed from Fig. 15 for the same period and justifies the assumption. We can thus logically assume that the 1% decrease in the rate of increase was continuing for as long as 5 years. Thus the sudden jump beginning in 1978 (Fig. 15 & Fig. 17) is an extreme, unrealistic and unjustified aberration. The continuing drop in the rate after 1978 and to 1985 appears to be realistic. The error is the extreme aberrated basis of 1978.

The Federation, per se, are not economists. We are just people, nearly 200,000 of them. We do see that unemployment continues to plague the nation. We do see that the highway building program is in desperate trouble with California, a leader in freeway building, reducing it's "Cal Trans" labor forces drastically. We do see ever increasing costs of energy sources. We do see alarming increases of other cost of living. We can envision a changing economy from one of abundance to one of "have less" or even "have not".

The Federation therefore questions the validity of the basic data justifying the need for the Kaiparowits Power Project and requests the Bureau of Land Management to either outright reject the proposal, or at least to withhold approval until a more realistic and reliable use demand basis is established.

The staff of the California State Energy Resources, Conservation and Development Commission has also come to a similar independent conclusion that questions the need for the Kaiparowits Project at this time.

Inadequate Treatment of Long Time Impacts

As mentioned at San Bernardino, the E.I.S. is very incomplete on the long term after effects on the environment caused by the project.

No one is quite so naive as to believe that any group of profit minded concerns is going to sink 2 billion dollars into a project and at the end of 35 years walk off and abandon the physical facilities. The E.I.S. make no assumption as to their disposal, continued use with fuel from a new or expanded use of the same deposits, where from and how the fuel will be transported, the additional impacts on other areas in the future, etc.

The E.I.S. but vaguely mentions possible continued recreational degradation of the 30,00 square miles of of expected impacted area around the total facilities. No indication is given as to the possible future length of operation of the plant, at what level, with coal from other available sources. How much? How Long?

The E.I.S. does admit to a probable subsidence of some 28 square miles of by 15 to 18 feet. Some disturbance or interruption of under ground aquifers is anticipated, which will adversely affect the flow of wildlife sustaining water from springs and seeps. The possible length of this depletion is not delt with. The mined out areas will be below the level of the surrounding surface and any faulting or rock cracking developed during the subsidence will cause water courses to discharge downward through such cracks into the mined out areas. The mined out areas will leave vast amounts of voids which will remain after subsidence. These voids will trap tremendous quantities of water and retain the water for a very long time before water levels and pressures will force it out at lower elevations or into other aquifers that terminate at some remote place. No mention is made of this real threat to wildlife sustaining water.

Also the water that is trapped and stands for long spans of time in the mined out areas will absorb contaminating substances that

can very well make the water, if and when, it surfaces unusable or even dangerous to wildlife, and even to humans. This is a very real and dangerous consequence, that should be included in the E.I.S., if it is to be meaningful and fulfill its intended lawful meaning. There are many mine water outcroppings in other parts of the country to amply sustain this contention.

In short there is a grave danger that a vast area can be ruined as a wildlife habitat. This should be spelled out in the E.I.S.

Transmission Line Corridors

In reference to transmission line locations, the argument is made that lines can not, or should not, closely parallel one another and should be placed on a new right-of-way at some distance from existing transmission lines. The argument appears to stem from an assertion that lines should be separated to reduce the risk from lightning strikes. No data is presented to support this claim. On the other hand, transmission line construction refutes the veracity of such claims.

Alternating current or "AC" transmission requires three wires and direct current "DC" requires two wires to complete one circuit. It is very rare in lightning strikes that more than one of the wires in a circuit will be hit. It is true that where the top wire, which is most often hit, lower wires may also be damaged, not by the lightning, but by the falling wire. Not all lightning strikes bring down any wires. Often only a circuit breaker is opened, and service is restored in only a few seconds. It is also extremely rare that a closely adjacent circuit is simultaneously hit. There are many thousands of miles of twin (two) circuit transmission lines with one circuit on each side of the towers. Experience does not bear out that this is much a problem as to keep utility companies from continuing to use and build twin circuit high-voltage transmission lines.

There are also, too many to mention, cases of parallel transmission tower lines. However two will be specifically mentioned, which cross large expanses of deserts. One is the nearly 200 miles of

the City of Los Angeles 3 single circuit AC 300,000 volt (to be increased to 500,000 volts) towers on a 600 foot right-of-way from Hoover Power Plant to near Victorville, California. The other is the 250 mile 230,000 volt AC City of Los Angeles line from the Owens Gorge, north of Bishop, Calif., to L.A. that has been paralleled on the same right-of-way by the Department of the Interior's 750,000 volt DC Pacific Intertie. If paralleling is bad practice, why did the Department of the Interior place such an important line as the Pacific Intertie closely beside another high-voltage line?

The Federation, therefore, strongly urges the Bureau of Land Management not only, in the case of Kaiparowits, but in all other instances to require, as a matter of policy, that wherever possible, high-voltage transmission lines be placed in corridors with tower lines reasonably close spaced so all can be constructed and maintained by a common road system.

A classic example is the Glen Canyon, Navajo, Hoover Dam, Mohave power plants to the Southern California use area. Parallel the Glen Canyon, Navajo plants to the Hoover Dam, Mohave plants. There are then three corridors into Southern California;

1. The City of Los Angeles Hoover to Cajon Pass corridor,
2. The Southern California Edison Mohave to Cajon Pass corridor,
3. The Metropolitan Water District Hoover to Julian Hinds to San Geronio Pass corridor. Kaiparowits, if built, hopefully not, would feed into this corridor system near Page, Arizona.

DO NOT CUT UP THE DESERTS WITH MORE T-LINES. UNLIKE THE JAPANESE, POWER LINES ARE DISPLEASING TO THE AMERICAN SENCE OF ENVIRONMENTAL BEAUTY.

FOUR CORNERS WILDERNESS WORKSHOP

P. O. Box 998
Shiprock, New Mexico 87420

November 12, 1975

Paul L. Howard, State Director
Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

These are comments concerning the draft environmental impact statement concerning the Kaiparowits Project. Please make it part of the hearing record.

We have only the summary of this statement and will comment on this. Perhaps some of our points are covered in the main body of the report.

Chapter 1-13, New Town: Planning has been extremely inadequate for other western projects especially in Wyoming. Some planning is mentioned briefly here but this should be one of the major impact considerations. What about initial affects of school establishment on taxation of local property.

Chapter 11-9, The statements concerning declining population in Page, Arizona have now become erroneous. Per capita income should not be allowed to be confused with life quality which is quite high for rural residents.

Chapter III. The environmental impacts are such that we strongly oppose construction of the Kaiparowits Plant. They will permanently injure a very beautiful part of America which belongs to all its citizens. Actual acreages of different kinds of destruction actually mean little. Scenic values are destroyed over much larger areas. Scattered developments and power lines disturb vegetation, increase erosion and disrupt wildlife over areas greatly exceeding actual ground occupancy. The mitigating measures of Chapter IV and unavoidable adverse effects of Chapter V are hardly reassuring.

Chapter VI. It should be brought out that coal mining is a destructive activity. A resource is consumed which will not be available to future generations. Jobs which are created will eventually be eliminated and very serious social problems such as those in Appalachia are liable to arise. Wilderness and scenic values will be destroyed. Potential for other land uses will be seriously impaired or destroyed on subsidence areas.

Chapter VIII. Alternatives. There has been questions raised if additional power is actually needed in the areas this development will serve. This evidently needs more study. An unmentioned alternative that might be a "lesser of two evils" would be to construct the power plant adjacent to the one at Page and build additional power lines if necessary adjacent to existing lines to lower impact.

The existing Page plant brings up the question of the need to consider the combined effect of all power plants proposed for this unfortunate area.

Sincerely,

Belva Christensen
Belva Christensen



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20461

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NOV 14 1975

Mr. Paul L. Howard
State Director
Bureau of Land Management
Department of the Interior
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

We have reviewed the draft Environmental Impact Statement concerning the Proposed Kaiparowits Project.

On the basis of our review, we are concerned with the impacts on populations from degradation in air quality and the potential land pollution which will result from the proposed emission of 34 tons of sulfur dioxide, 12 tons of particulates and 250 tons of nitrogen oxides per day from the plant.

We found the discussion of the feasible and viable alternatives to the proposed project to be inadequate. In no instance is there a comprehensive discussion of the relative health effects of the proposed alternatives. Also, the draft document states that "the alternative of using nuclear power is economically feasible, but scheduling of nuclear plants is uncertain at this time." It appears likely that the use of nuclear power as opposed to the coal fuel facilities would result in lesser environmental and health impacts. The health effects and long-term implications of the alternative "Delay and Denial" should also be discussed in greater depth in the final statement.

What provisions have been made for providing an adequate water supply and other services to support the population of the new town? We suggest the Federal and State agencies be assured that adequate facilities will be developed and maintained in accordance with approved standards for housing, recreation, aesthetic amenities, transportation, etc.

Thank you for the opportunity to review the document.

Sincerely,

Charles Custard
Director
Office of Environmental Affairs

11-744



ENVIRONMENTAL MANAGEMENT AGENCY
101 NORTH BOWEN
SANTA ANA, CALIFORNIA

NOV 13 1975

H. G. OSBORNE
DIRECTOR

Mr. Paul Howard, State Director
Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

The following comments constitute the response by the County of Orange to the Draft EIS for the Kaiparowits Power Project. The Orange County Environmental Management Agency is a recently formed consolidation of six previously separate County departments and special districts (Planning, Road, Flood Control, Building and Safety, Harbors, Beaches and Parks, and Air Pollution Control) which has been authorized by the County Board of Supervisors (Resolution 75-78) to review and respond to all environmental documents submitted to Orange County by other agencies. (This letter relates primarily to that 16-mile portion of subject property (latter part of the Devers-Serrano segment) which will traverse and impact unincorporated County of Orange territory.

Your organization is to be complimented for the massive amount of data collected and published in the draft EIS. The draft EIS provides considerable amounts of information as related to the project and its impact on the unpopulated desert area of Utah, Arizona and California where the major portion of the facilities are to be located. However, the information related to the project's impact in Orange County's populated areas is inadequate. In order to improve the EIS's adequacy, we suggest the following improvements:

1. Page I-223. Provide a map at a smaller scale (1:10000 or 1:20000) which will clearly delineate the proposed right-of-way alignment and the locations of all proposed tower structures and access roads. Please provide same for the "Alternative Route." (See page VIII-182.)
2. Page I-248. Indicate the number of tower structures, the size and location of access roads, and the length of right-of-way which would be constructed within Orange County for the proposed route. Please provide same for the "Alternative Route." (See page VIII-192.)
3. Page II-168. Indicate the extent of vegetation removal and landform alteration necessary for construction of the proposed route by using maps and cross-sections. Please provide same for the "Alternative Route." (See page VIII-194.)

TELEPHONE: 834-0678
AREA CODE 714
MAILING ADDRESS:
P.O. BOX 6842
SANTA ANA, CALIFORNIA 92702

FILE

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NOV 13 1975
Paul Howard
Kaiparowits Power Project
Page 2

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4. Indicate the extent of visual impact. Will tower structures and lines be silhouetted against the skyline? Will the towers and lines be visible from existing and proposed regional parks and scenic highways? If so, indicate those areas of tower and transmission line visibility and, if possible, provide mitigation measures. If the proposed alignment is selected, a variation of this route realigned to the north on the unpopulated side of the ridge above Silverado Canyon would be a meaningful improvement to the project.

5. Page I-248. Please provide a data sheet comparing the "Proposed Alignment" versus the "Alternative Alignment" to include those items listed above and all other proposed facilities and potential impacts. When completed, this sheet should provide a basis for selecting the least environmentally damaging alignment.

6. Page I-44. Please provide the methodology used for determining the location of the "Proposed Alignment" and an explanation for selecting that alignment over the "Alternate Alignment."

7. Page I-230. Please discuss alternative tower designs which will "blend" or be more compatible with existing environmental conditions. County staff recently met with representatives of Southern California Edison Company and was provided photographs comparing the visibility of conventional lattice type towers and newer Guyde-type towers. Such information should be in the EIR.

8. Page II-410. The project's impacts upon existing and proposed County Regional Parks should be identified, such as tower designs, recreational use of easements, alternate alignments, as well as any mitigation measures designed to minimize these impacts. The following parks may be impacted visually by the proposed project:

- a. Upper Silverado (proposed)
- b. Limestone - Santiago (proposed)
- c. Irvine (existing)
- d. Villa Park Dam Park (existing)

A copy of the Orange County Master Plan of Regional Parks (a portion of the County's General Plan Recreation Element) is enclosed for your information in this regard.

9. The Orange County Scenic Highway Advisory Board has reviewed this project and offers the following comment:

"The proposed Kaiparowits transmission line project crosses Weir Canyon Road (alignment conceptually proposed) and would probably be visible from Santiago Canyon Road (existing). Both of these roads are proposed scenic routes in the adopted Scenic Highway Element of the County General Plan. The construction of transmission lines along the proposed alignment would therefore have a negative impact on the proposed scenic corridors. The Advisory Board is concerned about the construction of such facilities through those remote areas of Orange County without other feasible alternatives being explored. It is recommended that alternative routes be considered, particularly along existing transmission line easements to limit the area which would be impacted by those facilities."

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10. At least one half of the Orange County portion of the project traverses areas designated on the County's General Plan Land Use Element as "Open Space." One purpose of this designation is to respect and preserve the unique scenic and open character of the Cleveland National Forest through careful and comprehensive planning. The proposed project reflects little regard for this open space designation as there is no account in the EIS of the project traversing and impacting officially designated open space areas. A copy of the County's Land Use Element is enclosed for your information. Construction as proposed would have a detrimental effect on that open space. Various mitigation measures, careful realignment of the proposed route to avoid environmentally sensitive areas, or an altogether different alignment such as the Alternative Alignment or a variation thereof should be thoroughly considered.

11. Page II-372. No mention is made of the adverse environmental impacts we anticipate affecting the community of Silverado. Silverado is presently a rural community with a population of approximately 950, served by four and two lane arterial highways. This community and the County as a whole is quite sensitive to public or private activities which impact their nature-oriented life styles. At present there are no high voltage transmission lines traversing the Silverado Canyon area. The visual impact of placing these towers in this scenic open space and recreation oriented area will be negative and easily avoidable if the Alternative Route were followed. If the proposed route is selected over the Alternative Route, or a variation of the alternative, placement of the towers along ridges would be an adverse impact. The impacts of construction would also be negative, in that trucks and other vehicles necessary to prepare sites for placement of 127' high towers and for later maintenance will have to traverse undeveloped and thickly vegetated mountain sides and would therefore be disruptive to the area. The potential impacts associated with the proposed alignment can be totally mitigated in this area by following the Alternative Route transmission system or a variation thereof through Santa Ana Canyon. The need for additional access roads in Santa Ana Canyon would be minimal, if at all, as there currently exists numerous roads along the north facing slope of the Santa Ana Mountains. Additionally, the degree of visual impact would be significantly less for the Alternative Route as Santa Ana Canyon is under increasing development pressures and currently provides transportation routes for the Riverside Freeway, Southern Pacific Railroad, and an existing 22 KV transmission line already traversing the canyon on its route to the project destination at Serrano substation.

12. The County is concerned with the progress this project has taken prior to the EIS being completed, specifically U.S. Forest Service and Southern California Edison Company approvals and acquisition efforts for the right-of-way in Cleveland National Forest. Representatives of the U.S. Forest Service have indicated that their agency has already signed agreements with the Southern California Edison Company as to the specific location of the line in Orange County, and property owners within the "Proposed Alignment" right-of-way have been approached by the utility company concerning easements and acquisition of property. To this date, local residents' contacts with utility company and Forest Service staff have consisted of hearing where it has been decided the project will go rather than soliciting their concerns as to what the impacts

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12. (contd.)

of this project may be on their community. The County was initially made aware of this project in August of 1974 at a meeting called by representatives of Southern California Edison and the United States Forest Service. At this meeting these representatives indicated that they had already selected and approved an alignment. Concern for adequate public exposure and the methodology used for alignment selection were expressed at that time and the methodology used for alignment selection was discussed. The Environmental Management Agency is still concerned with public exposure and alignment selection methodology. If the "Proposed Alignment" is officially selected after this EIS is finalized the County of Orange requests that the Final EIS discuss the relationship between the EIS and the projects selection and approval process.

Very truly yours,

H. G. Osborne
H. G. Osborne, Director

JLA:TSB:jrs

Attached: Master Plan of Regional Parks
Land Use Element

IX-79



COUNTY of RIVERSIDE

ROBERT T. ANDERSEN
County Administrator

ROBERT J. FITCH
Asst. Chief Admin.
Officer

HAROLD WELLS
Asst. Admin. Officer

WAYNE B. CURREN
VINCENT E. MASON
WILLIAM A. RUEGGER
PHILIP W. TRUE
Asst. Asst. Dir.

129

129

JKL: 63960

November 14, 1975

United States Department of the Interior
State Director, Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

Dear Sir:

The Riverside County Board of Supervisors discussed the subject environmental impact statement at its November 10, 1975 meeting. As a result of this discussion the Board of Supervisors has directed that the attached recommendations be forwarded to you.

Also attached, for your information, are copies of: 1. A Planning Department Staff Report on the subject Environmental Impact Statement as presented to the Riverside County Planning Commission October 29, 1975; and, 2. A letter from the Commission to the Board outlining their recommendations.

The County of Riverside is pleased to have had the opportunity to comment on this project. If clarification is needed on any of our recommendations, please let us know.

Very truly yours,

COUNTY OF RIVERSIDE

Robert T. Anderson
County Administrative Officer

RTA/pnp

CC: Clerk of the Board
Planning Department

1056-2821/01/0000-0000\$05.00/0

1975

Charles Schwab & Co. Supercenters
10000 American Lane, Suite 100 - 16th Floor
Irvine, California - 92618

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AGENDA: Board Order 9-10-75
Agenda Item 9.5
Karpisovits Power Project

During the Spring Session and September 20, 1974, the Planning Commission on March 2, 1974, discussed the content of this Management Environmental Impact Statement and the findings regarding the project. The review of the Planning Department and the Planning Commission was particularly helpful in the adoption of the final Management Environmental Impact Statement. The Planning Commission also discussed the findings of the Environmental Impact Statement and the findings of the Environmental Impact Statement.

1. The Federal Labor Management Administration be asked to conduct an audit designed to provide input on the need for the proposed proposed operating facilities and related components.
2. The Government Labor Relations Commission be asked to review the status of communication line, signal and related facilities in Southwest Florida.
3. The Director of Base Management provide for additional study and status of the status of communication facilities, as well as personnel and other data be reported to the County.
4. The Government Labor Union be limited to existing established communication lines to the State and operations as operated by Wilson be maintained.
5. The County be requested to require the FLM to make a full disclosure of all proposed, anticipated, plans and reports that could result from the plans and measures that should be provided to mitigate these threats.

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Board of Supervisors
October 31, 1975

6. That the Board of Supervisors have a reasonable and valid concern about the extensive, significant, and permanent impact on the property values and scenic, archaeological, recreational, agricultural, and environmental values of this place in Riverside County; and further, that an extension of time to permit to hold public hearings to receive comments and/or recommendations to be heard.

Respectfully submitted,

CLERK OF THE BOARD OF SUPERVISORS

[Signature]
CLERK OF THE BOARD OF SUPERVISORS

Attest:

me:

cl:

Supervisor (5)
Clerk of the Board
Board Agenda
File copies (2)

IX-748

RECEIVED
NOV 13 1975

OFFICE OF THE CLERK OF THE BOARD OF SUPERVISORS

County of Riverside, State of California

129

RIVERSIDE COUNTY
PLANNING COMMISSION
4.28 On motion of Supervisor Record, seconded by Supervisor Jones and duly carried by unanimous vote, IT WAS ORDERED that the following recommendations be adopted for the Kaiparowits Power Project from the Bureau of Land Management Environmental Impact Statement:

1. That the Federal Energy Resource Development Administration be asked by the Bureau of Land Management to provide input on the need for the proposed Kaiparowits generating facility and related components.
2. That the California Public Utilities Commission be asked to review the question of transmission line siting and related facilities in Riverside County.
3. That the Bureau of Land Management provide for additional study and review of the impacts of the transmission facilities, as well as additional alternative routes proposed in the County.
4. That transmission facilities be limited to existing established Corridors and that the 2000 feet separation as proposed by Edison be restudied.
5. That BLM be requested to expand the EIS to make a full disclosure of all proposed transmission lines and impacts that could result from those lines and any measures that could be proposed to mitigate those impacts.
6. That deep concern at the extensive, significant, and permanent impacts on the property values and scenic, archaeological, recreation, agriculture, and environmental values of the project on Riverside County be expressed and that extension of time to permit concerned citizens an opportunity to be heard is hereby requested.

and,

IT WAS FURTHER ORDERED that a Master Plan with wider corridors be considered and that no project be granted until such time that all proposed project plants have been reviewed, and

IT WAS FURTHER ORDERED that the State Energy Commission be asked to receive all proposed energy power projects before any projects are permitted.

I hereby certify that the foregoing is a full, true and correct copy of an order made and entered on

November 10, 1975, Book 93 page _____ of Supervisors Minutes.

WITNESS my hand and the seal of the Board of Supervisors

Dated November 10, 1975.

DONALD D. SULLIVAN, Clerk of the Board of Supervisors,
in and for the County of Riverside, State of California.

By *[Signature]*, Deputy

RECEIVED
NOV 13 1975

OFFICE OF THE CLERK OF THE BOARD OF SUPERVISORS
County of Riverside, State of California

(129)

RIVERSIDE COUNTY
PLANNING COMMISSION

4.2b On motion of Supervisor McCandless, seconded by Supervisor Record and duly carried by unanimous vote, IT WAS ORDERED that the Public Utilities Companies and those regulatory powers and Energy Commission develop a master plan of proposed transmission lines of projects existing or proposed and what effect it would have on Riverside County.

Form 100-10
Revised 10-1-75
10-1-75

(129)

PLANNING COMMISSION MEETING
NOVEMBER 13, 1975

RESOLUTION: To Order No. 1075, the Planning Commission authorized the Riverside County Board of Supervisors to conduct a land use development study of the area within the Riverside County Project, including all the adjacent Riverside County.

RECOMMENDATION: That the Planning Commission recommend the following to the Board of Supervisors:

1. That the Board of Supervisors authorize the Riverside County Board of Supervisors to conduct a land use development study of the area within the Riverside County Project, including all the adjacent Riverside County.
2. That the Riverside County Board of Supervisors authorize the Riverside County Board of Supervisors to conduct a land use development study of the area within the Riverside County Project, including all the adjacent Riverside County.
3. That the Riverside County Board of Supervisors authorize the Riverside County Board of Supervisors to conduct a land use development study of the area within the Riverside County Project, including all the adjacent Riverside County.
4. That the Riverside County Board of Supervisors authorize the Riverside County Board of Supervisors to conduct a land use development study of the area within the Riverside County Project, including all the adjacent Riverside County.
5. That the Riverside County Board of Supervisors authorize the Riverside County Board of Supervisors to conduct a land use development study of the area within the Riverside County Project, including all the adjacent Riverside County.
6. That the Riverside County Board of Supervisors authorize the Riverside County Board of Supervisors to conduct a land use development study of the area within the Riverside County Project, including all the adjacent Riverside County.
7. That the Riverside County Board of Supervisors authorize the Riverside County Board of Supervisors to conduct a land use development study of the area within the Riverside County Project, including all the adjacent Riverside County.

NOTES:

Project Summary: The Riverside County Board of Supervisors authorized the Riverside County Board of Supervisors to conduct a land use development study of the area within the Riverside County Project, including all the adjacent Riverside County.

Completion of the four stages of the project (over 750 sq miles) is estimated to take about 18 months. The Riverside County Board of Supervisors will be continuously contacted and advised of the progress of the project.

The new facilities to be constructed and the resources to be expended during the 18 month period are estimated to be as follows: The Riverside County Board of Supervisors will be continuously contacted and advised of the progress of the project.

I hereby certify that the foregoing is a full, true and correct copy of an order made and entered on
November 10 75 93 page of Supervisors Minutes.

Witness my hand and the seal of the Board of Supervisors
Dated: November 10, 1975

DONALD D. SULLIVAN, Clerk of the Board of Supervisors,
in and for the County of Riverside, State of California.

(SEAL)

By: Ann R. R. R., Deputy

Proposed Transmission
Line Routing:

Alameda County will suffer no direct impact from the construction of the proposed generation plant and support facilities. The County will be benefited by the installation of the power transmission lines necessary to transport the energy generated at the Plant site.

Three sections of the 300 kv lines will span areas of the County. The corridors of these proposed lines are 350 feet in width, each tower is 126 feet high, and the lines will span 1500 to 1700 feet between each tower.

The Mojave to Denver substation portion enters Alameda County just east of Joshua Tree National Monument, and stretches south to I-10, paralleling the SRD 120 by right-of-way, and west along the south side of I-10 to the Denver substation south of Desert Hot Springs.

This portion will consist of 79.5 miles of right-of-way within the County. Major environmental impacts include the routing of lines during construction phases, the aesthetic impact of the lines crossing the southern entrance to Joshua Tree National Monument, and the visual impact upon Puschville Valley County Park. Other factors that could occur along this route include the inflicting of such archeological and historical sites as photographs and topographic sites, as well as Camp Young, General Patton's WWII desert training area. Another factor that must be considered is the improved access to the desert which the transmission line patrol roads will afford.

The Denver to Valley substation portion runs west along the south side of the San Geronimo Pass to Hemetown, then southeast through Lamb's Canyon to the proposed Valley substation near Roundland.

The aesthetic impact through this corridor would not be serious if this were the only transmission line system to be routed through this geographically sensitive to the metropolitan basin. However, the Edgemoor system will possibly be overlaid by the transmission line system of the 1960's.

Transmission lines to these parallel towers is facilitated by the physical fact that each system must be at least 2,500 feet away from the next.

Specific impacts include the crossing of State Route Highways Routes 60 and 240. These proposed scenic routes are required to be kept free of such visual intrusions as off-site signs and transmission lines.

This portion of the line also crosses the eastern flank of the Lakeview Mountains, and would probably have an adverse impact upon the photograph sites located there.

Som 45.1 miles will be required from the Denver substation to the western County line. A very crucial and volatile section of this routing is the 1-7 miles through the House Rock Desert, one of the most crucial portions of the San Geronimo Pass. Indian lands are not subject to condemnation, and this Indian group has indicated that they will not permit construction of the transmission line across their reservation.

The third portion of this route heads west from the Valley substation into the Puschville Canyon, then across the Santa Ana Mountains into Orange County and the Ferris substation. Transient Canyon is approximately twice as deep as the width and the western side of the canyon is heavily planted in citrus. The proposed route crosses this area and has aroused protest from a principal landowner in the area.

Alternate Routes:

Alternate transmission line routes are one type of mitigation that is offered. Other mitigation measures that will be taken during transmission line construction include the presence of a terrestrial biologist and an archaeologist who will review each tower site as construction progresses.

Alternate transmission line routes are discussed in the body of the Bureau of Land Management Environmental Impact Statement. The first, the RMZ West Valley Alternative, is offered because it would not cross the scenic Central Mountains (also Big Horn Sheep habitat), and by routing south of I-10 for 29 miles the alternate would avoid impacting the scenic values of Joshua Tree National Monument. Another, the South Into Little Lake, would diminish the visual impact upon travelers on I-10. However, it would sacrifice the visual impact upon visitors to Puschville Valley County Park.

MEETING. It is the intent of the Reading City Council, to ensure that all environmental factors are considered and the other in its location during and regulatory process and to ensure that all environmental impact reports and fully the spirit of the Act and the law concerning their preparation and execution.

SECTION 4. The City Council will pursue all legal avenues available to insure adequate preparation and review of the environmental impact report for the Kaiporewili Project.

ROYAL OF THE CITY OF BANGKOK

ATTEST: [Signature]
City Clerk

[illegible]

1. *Chlorophyll a* (Chl *a*)
2. *Chlorophyll b* (Chl *b*)
3. *Chlorophyll c* (Chl *c*)
4. *Chlorophyll d* (Chl *d*)
5. *Chlorophyll e* (Chl *e*)
6. *Chlorophyll f* (Chl *f*)
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¹ The authors are grateful to the National Science Foundation, Grant Number DMR-80-19675, for support of this work.

Certification
Resolution No. 1275-32

THE CITY OF DENVER, the City of Denver DO HEREBY CERTIFY that the above information was duly approved by the City Council of the City and that the same was duly recorded, having been held on September 25, 1975, by the City Clerk of the City of Denver.

1. The following information is being furnished to you for your information only. It is not intended to be used for any other purpose.

City of the City of
London, Ontario

RESOLUTION NO. 100

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF BANNING, CALIFORNIA PROTESTING THE CONSTRUCTION OF ELECTRICAL TRANSMISSION TOWERS IN THE SAN GORGONIO PASS, SPECIFICALLY THE "DEVERS-SERRANO SEGMENT" OF THE KAIPAROWITS POWER PROJECT.

WHEREAS, the installation of the Devers-Serrano transmission lines and towers will cause irreversible adverse effects to the visual quality of the Pass environment, and

WHEREAS, the proposed towers will be detrimental to the future use of the adjacent properties, and

WHEREAS, the installation of the transmission line in the San Geronimo Pass has not received complete or accurate review in the environmental process.

BE IT RESOLVED BY THE PLANNING COMMISSION OF THE CITY OF SANMING AS FOLLOWS:

SECTION 1. That approval of the Unvers-Serrano segment of the Kaiparowits Power Project be denied.

SECTION 2. That a Master Plan of present and future transmission routes be prepared and evaluated prior to any consideration for approval of the Kaiparowits Project.

SECTION 3. That the Bureau of Land Management provide additional study and review of the visual pollution and effect of the proposed project.

SECTION 4. That additional public hearings be conducted in the State of California.

SECTION 5. The Planning Commission will make every effort to protect the environmental quality of the Pass Area and seek relief from detrimental actions through all legal avenues available to them.

THE SECRETARY OF THE PLANNING COMMISSION WILL CERTIFY TO THE PASSAGE OF THIS RESOLUTION.

Susan Hubbard
Susan Hubbard, Secretary

Y TO THE MESSAGE OF THIS

Ray Stubb

Ray Stubb, Chairman

Sun City
CIVIC ASSOCIATION

26850 SUN CITY BOULEVARD

714-279-9371

SUN CITY, CALIFORNIA 92381

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November 11, 1975

U.S. Bureau of Land Management
125 S. State Street
Salt Lake City, Utah 84111

Attention: Mr. Paul Howard, State Director
Re: Kaiparowits Power Project in Southern Utah

Dear Sir:

I am writing as President of the Sun City Civic Association representing a community of some 7200 citizens and wish to enter the following protest to the proposed project which definately affects our community.

- (1) We feel that this project will drastically affect property values in our immediate area.
- (2) We will be boxed in as we are located in the North end and Eastern location of the terminals separating the two power systems, one going West to the ocean area; the other going South to the San Diego Area.
- (3) This community depends entirely for its information and entertainment on radio and television. We feel that these high tension lines, in fact we know, will disturb much of this community's entertainment.

We are at a loss to understand why such a project that has been studied and undertaken for a number of years was not presented to this community until several days ago.

As a result we have not been able to thoroughly study all the many pages of this study, however in order to get a protest in under the deadline of November 14, 1975, we would like to ask the following questions:

1. Why did we not receive previous publicity on this project either from our local County of Riverside or you?

Sun City
CIVIC ASSOCIATION

26850 SUN CITY BOULEVARD

714-279-9371

SUN CITY, CALIFORNIA 92381

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November 11, 1975

Page 2

2. We understand there have been various conclusions given by the ecology studies, where can we get copies?
3. Where has this private agency derived its power to condemn properties as we understand parcels of land have already been purchased?
4. The question arises as to the probability or possibility of placing these high tension lines underground in residential areas such as ours.
5. Since this project has only been known to our public for a short period of time, it is disturbing and we as Officers of this Association are placed in the position that we must have additional information to properly advise our people.
- We therefore would appreciate being in constant touch with this project as it progresses and would appreciate any help you may give us as to how we might follow this more closely and eliminate the element of surprise on any of this that may be proposed in the immediate future.

Yours very truly,

Fred H. Blanchard
Fred H. Blanchard
President

FHB:bkg

1X-754



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII
1840 LINCOLN STREET
DENVER, COLORADO 80202

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12 NOV 85

Ref: 8N-EE

Mr. Paul L. Howard
State Director
Bureau of Land Management
P.O. Box 11505
Salt Lake City, Utah 84147

Dear Mr. Howard:

The Environmental Protection Agency has reviewed the draft environmental impact statement (EIS) for the proposed Kaiparowits Power Plant Project. I certainly appreciate the consideration which your office and the Department of the Interior have shown in granting an extension of the review time for this important EIS. I also am pleased to hear of the fine cooperation shown by your Environmental Projects Staff in helping us get the job done in the shortest time possible.

The comments attached to this letter detail our concerns for the environmental impacts of constructing the Kaiparowits project as presently planned. Briefly, the comments address:

- air quality impacts
- water quality impacts
- energy use projections and conservation efforts

In general, we found the EIS to be quite detailed in its discussion of the proposed project and probable environmental impacts. However, additional information for a few critical areas must be provided for the final EIS. These deficiencies are detailed in our comments.

When considering an energy development project of this magnitude, most of our concerns naturally center around the air quality effects of operating the plant. Careful attention must be given to striking a balance between meeting the country's real needs for additional energy, and maintaining the

Page 2

quality of our precious environmental resources of clean air and water. When considering proposals for energy development in relatively unspoiled areas of the country which would service fast-growing urban areas some distance away, this balancing procedure becomes especially delicate and important. On the basis of information presented in the draft EIS, we do not believe that this important balancing process has been adequately carried out. With specific regard for the air quality impacts of the project, we find that:

1. Insufficient modeling data are presented in the draft EIS for us to fully evaluate the impacts of the project, either at the formally proposed site (Fournile Bench), or at the prime alternative site (Nipple Bench). Although additional modeling work has been completed for the Fournile Bench site, these data were not completely presented in the EIS. If Nipple Bench continues to be seriously considered as a real alternative to Fournile Bench, a comparable, or even expanded, modeling effort would be required there. All data should at least be presented in an appendix, and accurately summarized and interpreted in the text.
2. The regulations for the Prevention of Significant Deterioration of Air Quality (PSD) are the single most important factor to be considered with regard to Kaiparowits. It is our opinion that Kaiparowits is subject to these requirements, although Legislative proposals now being considered in Congress may modify the final form of the requirements. As the PSD rules are now structured, Kaiparowits (assuming 90% control of sulfur dioxide) is a "borderline" case for meeting the allowable Class II SO₂ 24-hour increment.
3. If Bryce Canyon National Park and the Lake Powell National Recreation Area are redesignated Class I under the PSD rules, significant changes in the scope of the Kaiparowits Project would be required. This possibility must be thoroughly examined in the final EIS.
4. All estimates for sulfur dioxide emissions and concentrations presented in the draft EIS assume 90% control of SO₂ with the use of scrubbers. If, for some reason, the participants choose to reduce the percentage of SO₂ control planned for the project, revised modeling information would have to be obtained, probably in the form of a supplemental EIS. Factors such as the sulfur content of the coal and scrubber failures would have to be considered. The sulfur content of the coal is especially important, since lower average sulfur contents shown in coal analyses could conceivably tempt the participants to reduce their efforts for SO₂ removal. The final EIS should thoroughly consider these possibilities.

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Because of the impacts noted above, EPA has serious environmental reservations concerning approval of this project at either the Fourmile Bench or Nipple Bench sites. Substantial revisions to the EIS will be necessary before we are able to make a final recommendation.

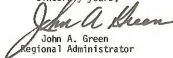
It has come to our attention that major changes in the Kaiparowits project are being considered by the participants. These include a re-evaluation of the John's Valley limestone quarry site; a preference for the Nipple Bench power block alternative; the possibility that plans for coal mining near the site will be abandoned; and the possibility that the level of SO₂ control may be reduced below 90%. If, in the opinion of BLM, these changes are significant, consideration should be given to re-issuing the EIS in draft form.

In view of the numerous interrelated impacts associated with energy development in the Southwest, a regional analysis of these activities should be prepared such as an update of the Southwest Energy Study.

Following our review of an important project such as this, it is EPA's policy to arrange a meeting with the Federal agency responsible for the project. My staff and I are available at your convenience to discuss our comments in detail, and we will be contacting your office soon.

Please send this office of EPA six copies of the final EIS at the same time it is made available to the Council on Environmental Quality. Again, thank you for your cooperation.

Sincerely yours,


John A. Green
Regional Administrator

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DETAILED COMMENTS
OF THE
ENVIRONMENTAL PROTECTION AGENCY
ON THE
DRAFT ENVIRONMENTAL IMPACT STATEMENT
KAIPAROWITS POWER PROJECT

AIR QUALITY

The potential impact of the proposed power plant on air quality has been evaluated by use of meteorological and air quality data gathering, smoke and fluorescent particle tracer studies, atmospheric visibility studies and atmospheric dispersion modeling. These studies all indicate that the air at the present time is clean and essentially free from sulfur and nitrogen oxides. Particulate concentrations are relatively high during strong wind conditions but generally are very low. Visibility is excellent, averaging greater than 70 miles.

The smoke tracer studies were conducted by North American Weather Consultants in vicinity of Fourmile Bench on four days (November 11, 12, 13 and 15, 1973). November 11 was the only very stable case and winds at release height were greater than 15 miles per hour, which would give good mixing. The fluorescent particle tracer studies were conducted in May, 1974, which is the time of year when best dispersion is expected. The meteorological conditions during these tests did not include the poorest dispersion conditions. However, the dispersion rates determined during these times were used for input to the INTERCOMP model in making the air pollution concentration estimates. Therefore, the estimates included in the EIS made from the INTERCOMP model are not indicative of highest concentrations which might be expected. Furthermore, an evaluation of the INTERCOMP model ("Evaluation of Selected Air Pollution Dispersion Models Applicable to Complex Terrain, EPA-450/3-75-059, June, 1975, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711) by EPA states:

"... if modeling results are to be used directly in source-control decisions, a reliable model estimate must represent the near-upper envelope of observable concentrations. However, INTERCOMP interprets a reliable estimate as one which best fits an average of observed data. This interpretation may lead to estimates of concentrations that are incompatible with the definition of short-term standards. Thus, a degree of control based on INTERCOMP's interpretation of a reliable model estimate may not adequately protect the quality of the air."

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The atmospheric dispersion modeling estimates were made using four different models:

1. The Gaussian Model and Assumptions used by NOAA in the Southwest Energy Study (SWES Appendix E, 1972).
2. The Valley Model under the Name CAMSD Developed by EPA.
3. Tennessee Valley Authority (TVA) Model (Montgomery et al., 1973).
4. The INTERCOMP Model (Intera, 1974).

Only the INTERCOMP model and NOAA model results were elaborated on in the report, probably because they represent the lowest and highest concentration estimates respectively. An errata sheet presents 1 and 3 hour concentrations estimated using the NOAA model and indicates that SO_2 levels predicted with this model are 5 to 20 times higher than those calculated by the INTERCOMP model (although still within ambient standards and significant deterioration limits). However, converting the maximum 3-hour concentration at Kaiparowits Plateau South (425 $\mu g/m^3$) to a 24-hour equivalent results in a concentration of approximately 170 $\mu g/m^3$, which is well above the allowable Class II increment (100 $\mu g/m^3$). All of the modeling data should be included in the final EIS, and the conclusions regarding ambient concentrations corrected accordingly.

The smoke and fluorescent particle tracer studies which have been conducted and the INTERCOMP modeling estimates are not adequate to assess compliance with the Class I significant deterioration increment. Furthermore, should the utility companies propose to decrease the control efficiency or propose a site other than Fourmile Bench, these studies are inappropriate to assess the environmental impact.

The final EIS should also discuss the consequences of relying on new coal analysis data which show that the average sulfur content of the coal to be used is lower by about 20% than indicated in the draft EIS. Emphasis on coal sampling and analysis during the mining operation, blending of coals, etc., is necessary to determine PSD compliance.

The final impact statement should document the extent of the brown atmospheric discoloration associated with the Navajo power plant's NO_2 emissions and any observable increase attributable to Kaiparowits. The EIS should further discuss the aesthetic and visibility impact of this brown atmospheric discoloration on canyons, drainages, and parks within sixty miles of the proposed site.

The report should reference the monitoring program results at the Navajo power plant and discuss any increase due to Kaiparowits' emissions in ground level SO_2 concentrations.

IX-757

The final statement should address the possibility that the participants may elect to reduce the control efficiency for SO_2 removal. Note that a decrease from 90% control to 80% control would result in a doubling of SO_2 emissions. This would affect compliance with PSD regulations at either site.

Probably the most severe particulate problem in the area is related to fugitive dust, both existing and contributed by operations supporting the facility. Wind blown dusts in the area already exceed the national standards in some areas in the vicinity and activities associated with Kaiparowits will increase the affected area. Additional information concerning this problem should be provided in the final EIS.

No attempt was made to predict the collective impact of the Navajo and Kaiparowits plants on ambient levels of SO_2 and particulates. A number of air quality studies are in progress in the vicinity of Navajo and its impact on SO_2 concentrations is much more significant than projected for Kaiparowits. The two plants are to be close enough to justify modelling together to insure that the collective contributions would not cause violations of the national standards. The air quality monitoring data taken in the vicinity of the proposed sites should be expanded to reflect the impact of Navajo.

WATER QUALITY:

1. The following selected quotes from the statement indicate that an adequate data base is not available to make a thorough evaluation of the water quality impacts of the project:

"Movement from water-yielding areas to Lake Powell is very complex, and because of the scarcity of data is poorly understood. Until the system is better defined, water monitoring programs and detailed hydrologic studies in the proposed project area are essential."

"Information about the locations, extent, and hydrologic properties of the perched aquifers, and the quality of water in them, is too meager to predict impacts on particular springs or to accurately evaluate them."

"Estimated concentrations of most trace elements that would be emitted by the proposed generating station would not exceed natural concentrations (arithmetic means of annual arithmetic means concentrations) measured at Page, Arizona, during the period 1969 through

1972. Therefore, the effect of those elements on water resources of the area should be negligible. However, there is insufficient data from which to determine how these elements would enter, concentrate and move through the hydrologic system; or how they would effect the system. Arsenic, mercury and titanium would apparently be emitted in larger concentrations than natural levels measured at Page, Arizona."

"Nitrogen oxides and trace elements from stack emissions, once deposited in Lake Powell, could result in algae blooms to the detriment of fish and other aquatic species as oxygen in the water is depleted. How adverse or widespread a reaction the NO_x and trace elements would have on algae bloom is not known at this time. Also not known is the effect NO_x and trace elements would have on vegetation and soils."

Data presented characterizing water quality conditions are not sufficient to establish baseline conditions due to the limited number of samples collected and gaps in parametric coverage, particularly heavy metals. Lab procedures used in sample analyses should have been cited, along with limits of detection, especially for toxic materials due to the concentrating and synergistic effects of these constituents on biotic communities at very low concentrations. The final IIS should indicate how these data deficiencies will be corrected, and whether additional data will be collected.

2. In assessing possible impacts of project development on Mahanewa, Warm Creek and other impacted bays, these areas should be recognized as individual microecological units within the Greater Western Long Island Sound estuary with the realization that strong interrelationships between these natural systems. Any monitoring program for impacted bays should consider the individuality of these microenvironments. In addition to traditional considerations, the monitoring program should include a chemical analysis of sediments to detect concentrations of toxic metals (total and dissolved) for representative areas in the respective bays.

3. Only two surface water samples were taken from Wahweap and Warm Creeks. This frequency is inadequate to determine ambient water quality conditions. No heavy metal determinations were made. The sampling may or may not have coincided with high and low flow periods.

4. A sampling program (baseline) for Wahweap and Warm Creek Bays is cited on pages A405-A413. However, no reference is made to sampling frequency or the number of samples obtained. The March-May sampling period is inadequate to characterize ambient conditions (long-term). The notation on page A404 that data cited in Figure I (A405-412) supports conclusions identified in the Water Resources section of Chapter II is erroneous. There has been little or no relationship established between these two portions of the EIS.

5. There appears to be no basis for the statement on page 111-117 that the average dissolved solids concentration of ground water out of the Navajo Sandstone formation is 750 mg/l. No dissolved solids data are shown for wells 18 and 19 on page 111-117. The dissolved solids concentration from Pump Canyon 29, page 111-117, is 141 mg/l. The dissolved solids concentration from the Navajo Sandstone formation, to be 141 ppm, and the dissolved solids concentration measured in well 18, 19, and 29, is 750 ppm. Based on the information, it cannot be 292 ppm respectively. Based on the information, it cannot be 750 ppm. The Navajo Sandstone formation would result in a salinity decrease in Lake Powell.

6. Information and conclusions relating to the fate of trace elements especially mercury, from the generating plant and mine are insufficient and inconclusive. Additional work is needed in this area to more specifically define the element emissions from the power plant; impacts of emissions upon the land, air and water; bottom and fly ash enrichment factors; and solubility/leachability of trace elements from the waste material. It is also unclear that background levels at the Kaiparowits site. Based upon the limited information presented on trace element emissions, such as: "Effects of trace elements on the soils in the Lake Puih-Bench" (page VII-263) be the same as on Fourmile-Bench? Additional information concerning mercury in Lake Puih is available in a paper entitled "Mercury Levels in Lake Puih" (Porter, et al., Environmental Science and Technology, January, 1975, pp. 41-46).

7. The statement on page IV-22 is incorrect and must be changed. It is stated: "Environmental Protection Agency Regulations require a no-return system. The participant's proposed system is in accordance with [sic] these regulations." EPA Regulations do not require a no-return system. These regulations, October 8, 1974 Federal Register, Title 40, Part 155, Section 155.6(a)(1) states: "...the discharge shall be no discharge of heat from the main condenser blowdown pond to the cooling tower blowdown and/or cold side cooling pond blowdown (emphasis added). Heat is considered a waste product of the cooling pond blowdown, not the discharge of water itself, respect to cooling water discharge, not the discharge of water itself."

8. Statements on page IV-1B are incorrect. It is stated that rainfall runoff will be retained in a basin for a minimum of 15 minutes as specified by effluent limitation guidelines established by the EPA.

The concept of segregating, for treatment, the first 15 minutes of rainfall runoff of combined waste water streams was presented in the

proposed guidelines published Monday, March 4, 1974, but deleted in the final guidelines. Final guidelines require that rainfall that is discharged (except untreated overflow from facilities designed to treat runoff associated with a ten-year, 24-hour rainfall) must meet the limitations of 50 mg/l total suspended solids and pH between 6.0 and 9.0 standard units.

9. Proposed rules have been published by EPA covering the Coal Mining Point Source category for NPDES point source permits (Federal Register, October 17, 1975). The proposed regulations would apply to this facility under the following categories: 1) Coal Preparation Plant, 2) Coal Storage, Refuse Storage, and Coal Preparation Plant Ancillary Areas and 3) Alkaline Mine Drainage. The proposed standard for the coal washery operation (coal preparation plant category) is "no discharge of process water." Total containment ponds properly sealed as proposed in the EIS would probably meet this proposed requirement. The other two categories will eventually have established effluent limitations on total and dissolved iron, aluminum, manganese, nickel, zinc, total suspended solids, and pH. If, for some reason, the plans for total containment are changed, any discharge from the latter two categories would have to meet these effluent limitations once the proposed regulations are promulgated. Adoption of the final regulations for the coal mining point source category is expected by December, 1975.

10. In order to analyze how surface runoff is controlled from the mine area and the coal processing and storage facilities, the detailed mining plan should include the layout of runoff diversion facilities, planned capacity, and an analysis of the size of storm such facilities are designed to control. The proposed standard is that all water quality control facilities (such as the proposed tailings pond and clear water pond) be able to contain the inflow from the 10-year, 24-hour precipitation event.

11. The draft EIS has not adequately addressed problems associated with the treatment of sanitary wastes (domestic sewage) in the Kaiparowits impact area. Increased populations in existing towns, and the development of a new town, will increase the need for new or expanded sewage treatment facilities. For existing towns, the final EIS should mention what facilities now exist, and an assessment should be made of the likelihood that expansion will be required. For all cases in the impact area, the EIS should discuss the increased burden of more waste loads on area streams and rivers. Information concerning these problems should be available from the 5-County Association of Governments, now in the process of conducting a water quality management program for both point and non-point water pollution problems in the area, under Section 208 of the Federal Water Pollution Control Act Amendments of 1972.

12. The EIS refers to the Colorado River Salinity Control Act of 1974 as the mechanism for controlling increased salinity concentrations resulting from Kaiparowits. Actual requirements for salinity control are derived from the Federal Water Pollution Control Act Amendments of 1972 (FWPCA). In the December 18, 1974 issue of the Federal Register, EPA published regulations (40 CFR 120) setting forth a salinity control policy for the Colorado River system, procedures for establishing salinity standards, and a plan for meeting the standards and implementation plan. Measures for controlling salinity increases from Kaiparowits must be consistent with the state plans. Salinity control measures specified by the Colorado River Basin Salinity Control Act should be viewed in the framework of the total salinity control plan developed according to the FWPCA.

CONSERVATION:

EPA questions the projected energy needs presented in the EIS for the market areas that would be served by the proposed Kaiparowits power plant. The information in the following table was derived from the energy growth curves provided in Chapter I of the draft EIS:

Projected Energy Needs for Kaiparowits Market Areas Through 1985

Market Area	Per Capita Energy Consumption	Peak Demand Growth Factor from 1973 to 1985	Generating Reserve Margin in 1985
Utility Company	(%Increase from 1973 to 1985)		(% of total Generating Capacity)
Southern California Edison Co.	54.7	1.8	21.6
Arizona Public Service Co. (APS)	90.5	2.8	19.2
San Diego Gas & Electric Co.	92.0	2.4	32.0

As shown in the above table, per capita energy consumption is projected to almost double between 1973 and 1985 in the market areas served by APS and San Diego Gas and Electric Co., and peak demand is projected to increase by a factor of 2.4 - 2.8 in these same areas. It is recognized that the projected increases in per capita consumption and peak demand are in part reflective of past growth rates. However, the past growth rates represent a time when electrical energy was considered to be abundant and cheap, and was used inefficiently and wastefully. Since readily usable energy sources are very limited, it is obvious that energy consumption cannot continue at past growth rates.

The generating reserve margins shown in the table above also deserve further attention. If each utility maintains such a margin, the implication is that as a nation we have a 15-20 percent reserve in generating capacity. Is such a large margin justified considering the system costs and adverse environmental impacts associated with maintaining such a reserve? How realistic is the peak demand upon which the generating reserve margin is based? Present peak demands rise considerably above the base load -- can this country afford the luxury of such peak load excursions in 1985? Readjustment of working and industrial schedules could considerably reduce the peak demand loads.

Consideration should be given to including in the final EIS an independent study of projected energy needs for the market areas of Arizona and southern California. Such a study would consider the limited supply of energy resources, the rising costs of energy development, conservation practices that will become necessary, and the limited carrying capacity of the market areas. The study cited in the EIS, which was conducted by FEA, cannot be considered "independent", since energy forecast data were supplied only by the participants.

It is worth noting two of the alternatives to uncontrolled growth of electrical energy usage that are discussed in the EIS. The implementation of one alternative (energy conservation by application of technology) projects greater employment and less dependence on foreign fuels than if the projected uncontrolled energy growth curve were pursued. Another alternative (zero energy growth) projects that employment would be seven percent greater in the year 2000 than if uncontrolled energy growth occurred, and importation of fuels would be even less than for the "application of technology" alternative. These two alternatives also offer the potential for less urban sprawl, less pollution and an enhanced quality of life.

If continued uncontrolled growth in energy consumption means fewer jobs, further degradation of air quality, water shortages and a deterioration in the quality of life, then it seems clear that as a nation we should be striving for a greatly decreased rate of growth in energy consumption.

The American people are willing to practice conservation in their daily lifestyle if it will mean less air pollution, according to a survey done for the Federal Energy Administration by the Opinion Research Corporation. Methods of conservation included turning off electricity 5 hours a day (47% agreed), paying \$300 for additional insulation in the home instead of \$70 a year for more electricity and fuel (67% would spend \$300 on insulation), and turning down the thermostat to 65 degrees in the winter rather than spend \$70 for additional electricity and fuel (73% opted for turning down the thermostat). An FEA summary of the survey pointed out that "Americans would rather see areas which presently have clean air kept clean rather than permit a pervasive air pollution in all

parts of the country." Most of the people surveyed (94%) felt that areas that now have clean air should be kept as clean as they are now. These data have important implications in terms of giving further consideration to the alternative of energy conservation.

ADDITIONAL COMMENTS:

1. Limestone quarry and limestone transport. Additional mine design criteria will be needed to evaluate the effectiveness of proposed runoff control measures and revegetation efforts at the limestone quarry.

Will diversion structures be placed above the mine cut to prevent runoff from entering the active mine? Will it be necessary to dewater the mine during operations? If more water is available than needed for dust suppression, how will it be handled? Has the water right problem associated with the limestone quarry been resolved?

Under the Alternative section for the limestone quarry, one site, Bucksin Mountain, is named on the map, but not described. Provided the limestone source here meets the quality criteria, the location would offer transport distance advantage and eliminate the impact to Bryce Canyon National Park. Regarding the proposed alternative, does the company propose to mitigate the truck noise level in any manner? EPA has established noise emission levels for Interstate motor carriers over 10,000 pounds as of October 15, 1975. Though these regulations will not legally apply here, we recommend that trucks meeting those standards be purchased for this operation in order to reduce the effects on the communities of Tropic and Cannonville. An evaluation of the road maintenance requirements as a result of the heavy truck load along the proposed route could be included in the final EIS.

If the alternative site near Caneau Peak were selected, potential loss of unique upper alpine habitat could occur. Unusual reclamation procedures would be needed to re-establish vegetation at this altitude. This might include restrictions on initial disturbance during late fall in order to minimize spring runoff erosion along unvegetated areas. Regardless of the site selected, EPA requests a review of the environmental assessment report prepared by the Forest Service on the details of the proposed limestone quarry.

2. Coal mine. Additional information is needed regarding the coal mining plan to evaluate the mitigating measures proposed to reduce subsidence. The report indicates that under areas of low cover, particularly below canyons, enough pillars will be left to reduce subsidence. We endorse such mining techniques, but in order to evaluate their completeness, request that either details of the mining plan be included in the EIS or the mining plan and its environmental analysis be distributed for public review prior to USGS approval.

3. The impact of the proposed aggregate site is not fully evaluated nor are alternate sites. There are no mitigating measures presented for exposure of ground water as a result of aggregate removal, and it is not substantiated that: "after a few storms, all traces of aggregate pits would be obliterated."

4. More attention should be given to the secondary impacts that would occur in the market areas as a result of building Kaiparowits. The EIS does recognize that the additional electrical power would facilitate urban growth and sprawl and that the "quality of community life would probably decrease even while per-capita income increased."

Specifically, what population growth would be supported in the market areas with the additional power? What would be the impact on air quality in the market areas due to the increased population? The comment is made in the EIS that the market areas have even a greater scarcity of water than the proposed plant site in southern Utah. What costs and environmental impacts will result from supplying the additional population with water? How much water will have to be diverted from agriculture to feed the urban growth? Since growth in the market areas and its attendant secondary impacts would be facilitated to some extent by the additional energy that the Kaiparowits plant would supply, it is important that these impacts be given more than a cursory analysis.

5. Consideration should be given to conducting an aquatic effects study of the possibility of fish fry impingement on the water intake system. The massive (44") size of this intake makes this study important.

6. The EIS should indicate that the use of scrubbers for SO₂ removal will also help reduce mercury emissions. Although no standards have been established to control mercury emissions, the fact that mercury levels can be reduced with scrubbers should provide an additional incentive for their use.



MORONGO BASIN CONSERVATION ASSOCIATION

POSTOFFICE BOX 210

TWENTYNINE PALMS, CALIFORNIA 92277

November 12, 1975

Mr. Paul Howard, State Director
Utah Bureau of Land Management
P. O. Box 11505
Salt Lake City, Utah 84111

Dear Mr. Howard:

The Morongo Basin Conservation Association **STRONGLY OPPOSES** the proposed Kaiparowits Project in Southern Utah, and requests that the Bureau of Land Management **DENY PERMITS** for its construction, because:

1. It would be the largest coal-burning power plant in the world, emitting about 300 TONS PER DAY OF AIR POLLUTION (even with controls working at top efficiency) in the heartland of our National Park System, smudging the skies above some of the most spectacular scenery in the United States--the region of Zion, Bryce Canyon, Capitol Reef, Arches, Grand Canyon, Canyonlands and Petrified Forest National Parks; and Cedar Breaks, Rainbow Bridge, Natural Bridges and other National Monuments and Glen Canyon National Recreation Area.
2. Kaiparowits would be only the first of four large coal-fired plants planned for this region, which with existing facilities and future planned additions would result in cumulative pollution which would degrade existing air quality in the entire region, adversely affecting for a small segment of our population the superb **NATURAL HERITAGE** that belongs to **ALL AMERICANS!**
3. The power plant and coal mine would consume approximately 50,000 acre-feet of water annually, in a chronically water-short region, precluding its use for agriculture, recreation, watershed and other purposes, most of which would be **SET OUT TO DRY UP IN EVAPORATION PONDS.**
4. The **1500-MILE TRANSMISSION SYSTEM, OCCUPYING 1,765 ACRES OF LAND IN FOUR STATES** "would create a major intrusion into otherwise natural landscapes" (EIS), with **VISUAL POLLUTION, LAND DAMAGE,** and encouragement of further destruction of the desert through off-road vehicle use of access and maintenance roads, and areas opened by them.

We ask that **COAL BE CLEANED UP BEFORE ITS INDUSTRIAL AND POWER PLANT USE IS EXPANDED**, to prevent degradation of clean air areas. One good possibility would be **GASIFICATION**, in a less environmentally damaging location; to create a relatively clean fuel, which could then be piped to areas of need, possibly enabling semi-coastal siting of power plants **WHERE THE DEMAND IS**, with use of ocean water for cooling.

We further ask that the **NEED for the Kaiparowits Project be reassessed**, since growth in demand for electricity is down, and is likely to stay down as long as rates remain high. We feel that **CONSERVATION** should be stressed, and that monies should be channeled into **RESEARCH AND DEVELOPMENT OF CLEAN, SAFE POWER GENERATION ALTERNATIVES AND UNDERGROUNDING OF TRANSMISSION LINES.** **SOLAR ENERGY** would be ideal for the Southwest.

Kaiparowits and its
Transmission Lines

- 2 -

November 12, 1975

In regard to transmission line routes being considered for Kaiparowits and future projects: (These statements pertain to the Mohave-Beyers portion of the line.)

The Morongo Basin Conservation Association **STRONGLY SUPPORTS** the "preferred route" in the Kaiparowits Environmental Impact Statement, along existing transmission lines, east and south of the Joshua Tree National Monument--the Ward Valley route endorsed by the San Bernardino County Board of Supervisors.

The Morongo Basin Conservation Association **STRONGLY OPPOSES** either of the alternative routes which would go through the Morongo Basin--the Sheephole Pass Alternative, or the Bristol Mountains Alternative. There has been strong public opposition since 1969 to use of the Morongo Basin for transmission lines, where none now exist. Many desert communities in this area are residential, retirement, health and tourist oriented, and would be severely impacted by transmission lines, which would degrade their scenic values and economic potential. This also is in accord with the Supervisors' statement.

Please include these comments with the statement made by the Morongo Basin Conservation Association at the September 19 hearing in San Bernardino on the draft Environmental Impact Statement.

Sincerely yours,

Francis H. Daft
Francis H. Daft
President

cc: Secretary of the Interior
Senator Alan Cranston
Senator John V. Tunney
Mr. Kenneth Kinblad, California PUC

IX-792

STATEMENT CONCERNING THE DRAFT KAIPAROVITS ENVIRONMENTAL IMPACT STATEMENT BY
DR. CLARON E. NELSON, PROFESSOR OF ECONOMICS, UNIVERSITY OF UTAH

As a regional/resource economist I am particularly concerned with two public interest implications of the proposed Kaiparovits power project which I do not feel are adequately evaluated in the draft EIS. The first relates to socio-economic stability in the area and the second to the impact of a regional agglomeration of electric generating facilities.

Experience has proven that whenever private costs and social costs diverge, our fundamental objectives of efficiency and equity in resource development activities are not served. Discussion relating to development of a community to support the Kaiparovits project are short-sighted. The necessary conditions for long-term community stability have not been met. The life of the project has been estimated at 35 years. During this period, the company will amortize its production-related investment. However, what will happen to the town when all or part of the operations cease? There is no assurance that substitute activity will be available to provide employment. The relative locational disadvantages of the proposed town sites for all but extractive economic activities are obvious. Considerable personal hardship could result for the residents of the community whenever the economic base evaporates. Years of investment in homes, businesses, social capital, etc. would become of little value.

Other residents of the state would not escape the effects of the cessation of operations. Undoubtedly, political pressures would result in direct financial support for the community and its residents. Also, the migration of the unemployed from the community would create additional problems in other areas of the region. It appears very unlikely to knowingly create an economically depressed area, even though it will be some years in the future.

A rational approach would be to cause both private and social costs to coincide, at least as nearly as possible. This could be done by requiring all capital costs necessary for the production facilities and their support to be private costs, amortized over the life of the project. The town is as necessary to the viability of the project as the actual production facilities. Historically, company towns associated with the development of natural resources were common. The connotation of a company town has not always been pleasant. However, this does not have to be the situation. What has been done by a private firm developing an area's resources was reported in the periodical Atlas for February, 1962, p. 111:

ARAMCO has built 200 miles of paved highways and has a large experimental farm under construction at Al Khafj. It has spent fifty million Swiss francs for three modern hospitals, built schools, instituted adult educational programs . . . Three clean, good-looking bungalow cities have sprung out of the desert. . . . The supermarkets, golf courses, swimming pools, snack bars, tennis courts and cafeterias are bordered with shrubbery--oleanders, jasmine bushes and bougainvillea. A central air-conditioning

CLARON E. NELSON

-2-

and heating system . . . insures ARAMCO employees a pleasant climate . . . Here one finds an ARAMCO television network, radio station and hotel, ARAMCO food, music, taxi service and even ARAMCO-cooled air--a perfect replica of the American way of life.

Establishment of a company-town, attractive to prospective employees, is an alternative which should be given careful evaluation.

Efficiency would be promoted since development of the project would take place only if the investment appears prudent, considering the traditional private costs for productive facilities and the equally necessary costs for a supportive viable community. Equity would be served in the sense that those who received the benefits would assume responsibility for a significantly greater portion of the costs. If the project life were extended or had a value for a later use, they would be benefited. If the life were shortened, those responsible would bear the costs. If current rumors are valid concerning the development of a railroad in the area, the company could at some future date, substitute cheaper Wyoming strip-mined coal for higher-cost Kaiparovits coal. If this were to take place, most of the local jobs could disappear within a few years, not even the 35 years projected. Without direct responsibility for the community such a company decision could be disastrous for residents and the area.

With a single responsible party for development, the Bureau of Land Management would be in a better position to insure adequate overall environmental protection. This control would be extended to an ultimate clean-up or restoration phase after the useful economic life has expired.

The second concern is with the interactive and agglomerative effects of the construction of several large coal-fired units, now proposed, in the southern part of Utah. The public interest cannot be served by the evaluation of each proposal on an individual basis. The aggregative impact on the environment and the economy must be determined. The general welfare provision of NEPA dictates, in this instance, evaluation of the known proposals on an area basis.

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CONSTRUCTORS CO.
JACK S. PARSON
CONSTRUCTION CO.
HECKETT ENGINEERING CO.
THE UTAH CHAPTER
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136

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OF THE INTERNATIONAL
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JOINT APPRENTICESHIP
SYSTEM OFFICE
P. O. BOX 768
SAN FRANCISCO, CALIF.
94101 (415) 431-3555

JOINT APPRENTICESHIP COMMITTEE

FOR UTAH
1958 West North Temple
Salt Lake City, Utah 84116
(801) 532-6091

November 12, 1975

Mr. Paul Howard
Bureau of Land Management
Federal Building
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

We, the Utah Joint Apprenticeship Committee for the Operating Engineers, are in favor of and do support construction of the Kaiparowits Project. It is the feeling of the Committee that training opportunities afforded our Apprentices due to this Project would be considerable; without this Project, the construction industry in the state of Utah would be subliminal.

Training opportunities would be for CITIZENS of the state with workers not being drawn from outside sources as this Committee's jurisdiction is the state of Utah.

Some applicants on our Lists await training opportunities several years. The work at Kaiparowits would afford registered Apprentices and applicants training opportunities and the ability needed to become skilled craftsmen.

Very truly yours,

John G. Thornton
Assistant Administrator

JGT/krt
opelu-31
afl-cio

17-76



DEPARTMENT OF
EMPLOYMENT SECURITY

547 North Main Street - Panguitch, Utah 84759

UTAH STATE EMPLOYMENT SERVICE

affiliated with
United States Employment Service

UNEMPLOYMENT INSURANCE

November 12, 1975

Mr. Gerald Ford
President of the United States
The White House
Washington, D.C. 20500

Dear President Ford:

I am writing this letter in support of the Kaiparowits project.

I serve in the capacity of Manager of the Utah Department of Employment Security office responsible for all employment service and unemployment insurance activity in Kane County where the plant is to be constructed. I also serve on the Governor's Planning and Development Council which was established by Governor Calvin L. Rampton.

It is my opinion, and I estimate that it is also the feeling of 85% of all the people in Southern Utah and 75% of all the residents of the State of Utah, that this project should be given immediate approval and that construction should begin as soon as possible.

If you were familiar with the economic history of Southern Utah I am certain you would understand why we are so interested in approval of this project. It is a highly seasonal economy, primarily dependent upon tourism and the lumber industry. As a result, the people work on an average of 7 months per year and the other 5 months they exist on unemployment insurance. It is impossible for the residents of this area to prosper under these conditions.

It would appear to me that a project which could save the United States of America from buying 33 million barrels of oil per year at OPEC prices should be a worthy consideration.

Let the people of Utah, and specifically the South-west district, make some of their own decisions. We have not grown up in isolation and therefore feel capable to determine our own fate.

Sincerely,

Herbert J. Allen
Panguitch, Utah 84759

Copies to:
Mr. Thomas Kleppe, Secretary of Interior
Mr. Paul Howard, Bureau of Land Management

Kane and Garfield Counties have suffered the plague of high unemployment during their entire existence. This is primarily due to the highly seasonal type of industry which provides jobs for people living in this area. We depend on the lumber and tourist industry for a large percentage of our jobs. The tourist industry is for a six month duration at most and at the end of October, which is the end of deer season, many of the businesses associated with this industry close down wholly or partially and their employees depend on unemployment insurance for their existence during the winter months. The lumber industry is very similar. The timber crews can only work during fair weather and this amounts to about six months of the year and then they are faced with the same bleak future as those in the tourist industry. With the depressed condition in the home building industry, the entire lumber industry has been very shaky, as a result, the people of this area are very concerned about the future. Similarly, the energy crunch has created a considerable amount of uncertainty in the tourist industry, therefore, we have nothing to look forward to except new development and if this is not allowed to take place, our whole existence is in jeopardy.

Unemployment rates in these two counties (Kane and Garfield) get as high as 25% of the labor force in Garfield and 16% in Kane with an overall average of around 15% in Garfield & 10% in Kane.

It is very difficult to be too concerned about a small amount of pollution in the air, when you are having difficulty putting enough food on your table to feed the kids. We must set our priorities, and I believe creating more permanent jobs should be high on our list.

721-2nd Ave
Salt Lake City
Utah 84103

12 Nov. 1975

Director, Utah State Office
ELM
Federal Bldg
Salt Lake City
Utah

Dear Sir:

Comments concerning the EIS for Kaiparowits:

My first comments concern the need for Kaiparowits: (Chapter I)

One can readily see that most of the Kaiparowits power (2628 mwatts) will be resold once it come into production, whether this capacity is sold from Kaiparowit or Navajo, or Mojave is not the question (See Figure 1). Once electricity is in the lines, along with interlocking system, the source is not recognized. Thus paragraph 2 under projected customer use is totally misleading and typifies utility advertising.

Figure 1. Megawatts of electricity resold in 1983.

Company	Planned generating capacity - 1983 megawatts	% Resale page 1-36	megawatts resale
APS	5000	16.6	863
SRP	4547	8.7	395
SDGE	4112	-	-
SGE	19578	7.0	1370
			2628

Figure 2 shows that SDGE is above the area averages for generating reserve margin. If one takes this surplus over 20% (i.e., 9%) one finds an additional mismanagement of 370 megawatts. (TOTAL MISMANAGEMENT PROJECTION IS NOW 2628 + 370 OR 2998 MEGAWATTS)

Figure 2. Generating reserve margin.

	Generating reserve Margin 1983
APS	21.7
SRP	20.3
SDGE	29.0
SGE	21.4

Figure 3 shows another cancer in projections. It behooves me to understand these figures. Arizona and southern California have a very similar ethnic, industrial, and agriculture base, yet per capital Arizona utilizes (APS and SRP) forecast twice the usage of electricity per capital. If we halve the APS and SRP projected planned generating capacity for 1985 we can save 2600 megawatts for APS and 2700 megawatts for SRP and then the Kwatts generating capacity per capital is in line with California.

Figure 3. Kwatts generating capacity per capital in 1985.

	Kwatts Generating Capacity per capital - 1985
APS	4.54
SRP	5.74
SDGE	2.48
SGE	2.42

NOW THE TOTAL MISMANAGEMENT CAPACITY OF THE CONSORTIUM IS 2998 + 2700 + 2600 OR 8298 MEGAWATTS BY 1985. Does this call for the construction of Kaiparowits? In agreement with the FEA on page 1-40, demand forecast are often disputed. However, the figures used above are THOSE of the utilities. It appears to me that the FEA has not looked closely enough at the companies figures. The fact that the FEA verification did not even question these consortium estimates suggests to me that the FEA consists of Utility presidents and Board of Directors. From the data presented in Figures 1, 2, and 3 it is not surprising at SRP dropped out of the picture.

Then on page 1-43 and again on VII-2, the amount of money to be saved by not importing foreign oil is totally out of place in view of the above discrepancies and the fact that the economics (cost/benefit ratios) are not at all discussed. (Unfortunately, the economics and the environment are so closely tied together that one should not separate them in an environment report. But if one brings up economics, one should discuss the entire economic picture, not just the portion saved by not importing foreign oil or mining less than 4 foot seams). The amount of projected waste (8298 megawatts) is a lot of capital tied up (also higher electrical rates for consumers) just to obtain low cost water, low cost coal, and a 35 year or longer regional devastation.

That 10,000,000 bbls of oil will still be burned at the plant, That 12,000,000 tons per year of coal will be wasted every year (that which will be left in the ground "unrecovered" because of economic reasons), and that the generating efficiencies of the plant is 0.35, thus wasting 7,800,000 tons of coal a year is considered beneficial to OUR COUNTRY.... surprised the hell out of me!

One mentions several times that the plant life of 35 year "does not mean that Kaparazit would necessarily lose its usefulness at the end of 35 years" (I-55). Yet on I-106, 101, the evaporating ponds are designed for only 35 years. How much of the other aspects of the Aaparoizits are designed for only 35 years? Will another EIS be filed after 35 years? VIII-221 mentions additional generating capacity at Kaparowitz (up to 12,000 mega watts). I feel that there should be a regional and national energy plan before Aaparoizits is built. Perhaps 35 years or 300 years or 2 years local planning and regional planning can have a better footing.

Page I-130 makes mention that it is uneconomical to mine beds less than 4 feet thick (this was alluded to earlier in this statement). Uneconomical is not the question. At what price does it pay to mine the coal in two foot seams. It is assumed that what is uneconomical for the consortium is uneconomical for the country. Yet the country has about run out of natural gas, oil is in great shortage, and now it looks like we are about to waist our coal resources. No where in the report is brought up the idea of a National Coal Reserve for the year 2000 A.D. Kaparowitz Coal Field could be just such as reserve.

Page I-130 mentions that 52000 tons of coal will be mined 5 days a week, 230 days a year. On page I-56 it mentions that the coal has 12.55% water (probably locked up with the carbon). This amounts to 6526 tones of water a day. From the conversion ratios: 1 gal water = 8.33 lbs, 7.5 gal water = 1 cubic foot, and 1 acre-foot is 43560 cubic feet, and of course 1 ton is 2000 lbs, it is calculated that one "burp" 4.8 acre feet of water a day or 1104 acre feet a year. This is not a trivial amount of water, especially in the desert, and especially in consideration that the mine will utilize 3100 acre feet of water a year. This water is wasted. Yet there are coal processes that utilize coal and water to form hydrogen, methane/methanol, and diesel fuel. The hydrogen can then be used to form ammonia- a fertilizer. Although there probably would be pollution, and a large requirement of water, the water in the coal could be utilized. Thus 1104 acre feet is lost. No section of the report discusses this aspect of coal-water and who has jurisdiction over it, and who can leave it.

Concerning the employees and the New Town, it is mentioned that "optimum construction scheduling would require periodic use of a second shift" (I-276). How many people could be brought in on a second shift? It one doubles the construction generating station, and addition of 145 people would be required. How can one plan a new town and have such a variable? It is this second shift (shift) that brought disaster to Rock Springs. Alternatively one can plan- not that which is most economical to the consortium, but that which is most economic to the region. Overtime pay is the usual process to get more work.

There seems to be a deficiency in housing. Figure 4 shows the problem. It looks like there is deficiency in housing for 600 persons a year. Temporary housing (I-316) for the first year does not begin to cover the 501 deficiency. Presumably the town construction itself would require personnel and that is not mention in I-376. This would make all the deficiencies even greater. Perhaps the bachelor quarters make up the difference. The 400-600 bachelors however will require some kind of prostitution if they live in the new town for very long. Then of course, if one towns in the second shift (instead of overtime), the entire housing plan is instantly obsolete. Contingency planning is of course characteristic of the energy towns in Wyoming and Montana.

There is still some sunshine in the region. Solar heating is presently available and works. The only plus for the new town would be a requirement of solar heating in all temporary and permanent housing. This is not even considered. More electricity will be required to supply the new town. Is this the reason for the 'proposed' Garfield Plant of UPL?

Figure 4. Housing deficiency proposal for Kaparowitz. From I-305, 306, and I-276.

Year	Total people working	Total housing	Difference
1	761	170	591
2	1667	1000	667
3	2811	2125	686
4	3643	?	

The transmission line segments of the report were too overwhelming to follow. However it is ironical that 1457 miles of transmission lines will require the construction of 1500 miles of roads, of which 570 will be permanent. More miles of roads that transmission lines! With this in perspective railroading the coal from Aaparoizits certainly looks more versatile and would not cause much more damage. Furthermore it can be used for the North in the winter (when converted to Natural Gas in the North) and it can be used in the south in summer (for air conditioning).

Page III-45 and many other places mentions that the effects of the Navajo plant are not known when assessing air pollution and other effects. It seems that before Aaparoizits even begins, all the effects of the Navajo plant should be studied and questions answered! The plant should be running for ten years for "better" averages. Fortunately we see that the Aaparoizits plant need not be built for ten years (VIII-6)

I thought that by now the question of water consumption was all thought out. I was surprised the the limestone quarry water was not available unless agriculture was sacrificed. The quarry workers would increase the water needs of Antimony and Tropic by 41%. No mention was made whether this was available.

111-296 mentions that many people use electricity but do not like power plants. This is rather ridiculous statement since most people are not given the choice of where the plant will be, what source of energy is to be consumed, of rates that penalize big uses and stimulate small (and conservation-minded) people. Even the Public Utility Commission and the FEA are useless in regulation of utilities in this respect. ~~XXXX~~ Only in the last year has the utility companies started to preach conservation and why we need more power plants while in the last 50 years the utilities have preach waste is good for the economy.

There are many other concerns. On 111-270 taxes generated are given. Now where in the report will be the cost to the Federal, State, or local government. Can one appropriate taxes generated unless they are balanced by expenses. Either economics should be brought in or left out. I know that governments always spend more than they receive so I would suspect that the benefits from the taxes would be non-existent- assuming that most of governments spending goes to costly destructive dam-building, war-making, and highway wasting projects.

On 1-313 under actions required of government agencies. When one moves 15,000 people (transients, itinerants, immigrants, etc.) who have no understanding of the land into an area where 3000 people have struggled, lived, and loved the land, it seems that government action will have to include increasing by 10 fold the numbers of people to watch and protect the land from misuse. In the report reference is made several times to poaching of game and livestock since the construction of Glen Canyon Dam. Reference is mentioned of the destruction that will be caused by ORV for a 100 mile radius. "Will Kapaciteit ever pay for this destruction since it is almost a certainty. Or will the Federal and State Government increase their personnel in the region? The personnel needs to be there on Day 1 of Year 1, not after the destruction has created a emergency Act! Where is this action of the Federal and State Government?

How can any administration approve of this project? It should be turned down for any one of many reasons. It is a destructive project to the surrounding lands. It is so very wasteful of our 'once in a lifetime' fossil fuel. And the electricity is NOT needed.

Sincerely,

Peter Hovingh
Peter Hovingh

ESCALANTE WILDERNESS COMMITTEE

NEW HAS A NEW CHAIRMAN

Dan Cortsen

6231 Meadowcrest Road
Salt Lake City
Utah 84121

877-1610

Other members with a position:

Trustee: June Vivant, 252 Douglas, Salt Lake City
84102; 5825850

Treasurer: Ruth Fear, 63-B Elizabeth St #4,
Salt Lake City, 84102; 533-0384

Correspondent: Linda Garrison, 1566 Evergreen Lane,
Salt Lake City, 84106; 466-2403

Consultants:

Jack McEllan, 2459 E 6600 South
Salt Lake City, 84121; 943-5720

Bob Thompson, 2454 E 1700 South
Salt Lake City, 84106; 582-0100

Pete Hovingh, 721-2nd Ave.
Salt Lake City, Utah 84103; 359-4791

Robert Hansell, PO 437, Panguitch
Utah 84759; 676-2656



Jackson, Wyoming--November 8, 1975

ALAN HARRIS
president
JIM CAMPBELL
vice president

ART WOODWORTH
secretary-treasurer
DICK BARKER
VERNE HUSER
JERRY SANDERSON
director at large

STATE DIRECTORS
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FRANK EWING
Wyoming



METROPOLITAN WATER DISTRICT OF SALT LAKE CITY

704 Tribune Building
SALT LAKE CITY, UTAH 84111

Nov. 12, 1975

WILLIAM C. HAGUE
General Manager

RESOLUTION PASSED UNANIMOUSLY BY THE MEMBERSHIP AT THE ANNUAL FALL MEETING--1975

A resolution regarding the Kaiparowits Power Plant Project (proposed):

WHEREAS,

the Western River Guides Association is deeply interested in the overall quality of the environment, especially in such areas as Grand Canyon National Park, Bryce Canyon National Park, Capitol Reef National Park, Glen Canyon National Recreation Area and adjacent territory, and

WHEREAS,

the Western River Guides Association believes that the proposed Kaiparowits power generation station would seriously degrade the quality of the air, drastically impair visibility, and otherwise have a definite negative impact on the environment of southern Utah and northern Arizona,

BE IT HEREBY RESOLVED,

that the Western River Guides Association is unanimously opposed to the construction of the Kaiparowits Project.

Witnessed by Verne Huser Verne Huser, Conservation Chairman

Proposed by Patrick Conley, Arizona State Director

Bureau of Land Management
Federal Building
Salt Lake City, Utah 84111

This letter is written in support of the Kaiparowits Power Project and to urge the Secretary of Interior to grant speedy approval. The delay of this vital project, which means a great deal to the State of Utah, has gone on far too long.

Every responsible official in the State, from the Governor on down, having to do with resource development has heartily endorsed the project time and again.

Let's get with it!

W. C. Hague
W. C. Hague
General Manager

National Campers and



Hikers Association Inc.

143

"The Friendliest People in the World"

November 11, 1975

State Director
Bureau of Land Management
125 - S. State Street
Salt Lake City, Utah 84111

KAIPAROWITS POWER PROJECT IN SOUTHERN UTAH

Dear Sir,

National Campers and Hikers Association is a non-profit camping (family) organization, with no paid officers. We are all volunteers, dedicated to reasonable conservation practices.

The N.C.H.A. of the far west object to any more power plants in Utah, Arizona or Nevada, to supply southern California with power, or any new power line corridors.

We realize that southern California needs power and power plants, and fuel must be available, however, they should be built in southern California, and the fuel shipped there by whatever means is feasible. Our area doesn't need, doesn't want, and can't tolerate any more pollution from this source. The economic benefits may be very attractive at the present time, but in the long run the cost of more pollution will be exorbitant, and much more than we can afford.

Now for the power lines: ABSOLUTELY no new power line corridors should be permitted! All new power lines should be put in present corridors. Again, these new corridors are for the benefit of Southern California, and the Arizona Strip is too beautiful to be desecrated and ruined by any more power lines. The only legitimate excuse or reason for new corridors is to save money in using a shorter route.

The last time the corridor was planned for the Strip we determined the added cost to avoid the Strip amounted to 17 cents per person, or less than .0023 cents per year, in their lifetime. PLEASE, we beg of you, don't approve this new corridor, under any circumstances.

Very truly yours,

Bill and Mary Lou Schuh
Far West Regional Directors N.C.H.A.

BILL & MARY LOU SCHUH
FAR WEST REGIONAL DIRECTORS, N.C.H.A.
8245 N. 27th AVE., 84494 HENRIK, ARIZ. 85021

NON-PROFIT EDUCATIONAL FAMILY CAMPING ORGANIZATION

LOVE THY NEIGHBOR - LOVE THY GOD

IX-770



THE DESERT PROTECTIVE COUNCIL, INC.

A NON-PROFIT ORGANIZATION

To safeguard for wise and reverent use by this and succeeding generations those desert areas of unique scenic, scientific, historical, spiritual and recreational value and to educate by all appropriate means children and adults to a better understanding of the desert.

BOX 4294 • PALM SPRINGS • CALIFORNIA 92262

11/4/75

DESERT PROTECTIVE COUNCIL

RESOLUTION ON THE KAIPAROWITS PROJECT

WHEREAS "Sixty million cubic yards of solid waste would be produced in 35 years which would permanently occupy 450 acres at 90 feet in depth" (EIS); and

WHEREAS the Kaiparowits 1500-mile TRANSMISSION SYSTEM, OCCUPYING 1,765 ACRES OF LAND IN FOUR STATES and creating about 2,000 miles of new roads would "create a major intrusion into otherwise natural landscapes" (EIS), with the VISUAL POLLUTION and LAND DAMAGE accompanying construction and maintenance of such a system; and would encourage increased off-road vehicle use, bringing further destruction of the desert; and

WHEREAS Kaiparowits would be only the first of four large coal-fired power plants planned for this region (Kaiparowits, Intermountain Power Project (IAMP), Garfield, Warner Valley), with more plants and additions now in operation and under construction at Huntington Canyon, Ivory, Reid Gardner and Harry Allen; and the existing Navajo Plant at Page only 36 miles away, producing definite additive pollution effects; and the resulting cumulative pollution effects, if all these plans were allowed to proceed, would mean degradation of existing air quality in the entire region; and

WHEREAS A SUPERB NATURAL HERITAGE BELONGING TO ALL OF THE AMERICAN PEOPLE would be degraded for the sake of generating INCREASED ELECTRICITY TO PROMOTE GROWTH IN OVERCROWDED CITIES in Arizona and Southern California, and for an economic boom in Utah; and

WHEREAS alternative methods of utilizing Utah's coal for energy could be developed, one possibility being GASIFICATION in a LESS ENVIRONMENTALLY DAMAGING LOCATION, creating a substitute fuel for natural gas, which could be piped to coastal regions, possibly eliminating transmission line problems and enabling siting of power plants WHERE THE POWER IS NEEDED, with ocean water for cooling at semi-coastal locations;

THEREFORE, BE IT RESOLVED THAT THE DESERT PROTECTIVE COUNCIL STRONGLY OPPOSES THE KAIPAROWITS PROJECT AND ASKS THAT THE BUREAU OF LAND MANAGEMENT DENY PERMITS FOR ITS CONSTRUCTION; while at the same time asking for REGIONAL ENERGY PLANNING, with emphasis on CONSERVATION; DISTRIBUTION OF ACTUAL NEED FOR POWER FACILITIES; siting of necessary power plants WHERE THE POWER IS NEEDED; development of clean, safe ALTERNATIVE ENERGY SOURCES with emphasis on SOLAR ENERGY for the Southwest; and a requirement THAT COAL BE CLEANED UP before being used as a fuel in power and other industrial plants.

Signed

Glenn Vargas, President

Please include this resolution in the official record of the hearings of the draft Environmental Impact Statement.

WHEREAS the "need" for the Kaiparowits Project is questionable, due to a DROP IN ELECTRICITY DEMAND GROWTH from the 6.8 percent for which the plant was planned to the April 1974-April 1975 Federal Power Commission figure of .5 percent, and a 5.6 percent drop in Southern California Edison Company's 1974 Kilowatt-Hour Sales; and

WHEREAS Kaiparowits would be the largest coal-fired power plant in the world; and its four 600-foot smokestacks would spew out some 300 TONS PER DAY of air pollution over the heartland of our National Parks System, where "Haze and sky discoloration... would adversely affect the scenic resources of South-Central Utah and North-Central Arizona" (EIS)--even with pollution controls working at top efficiency; and this would affect Grand Canyon, Zion, Bryce Canyon, Capitol Reef, Arches, Canyonlands and Petrified Forest National Parks; and Cedar Breaks, Rainbow Bridge, Natural Bridges and other National Monuments and Glen Canyon National Recreation area; and

WHEREAS the generating plant, coal mine, limestone quarry, new town, new highway, access roads and all support facilities would heavily impact 6,400 ACRES OF LAND IN A RELATIVELY UNPOPULATED AREA; and

WHEREAS large trucks hauling limestone from a quarry north of Bryce Canyon would make 30 TRIPS A DAY THROUGH THE PARK; and

WHEREAS the "indirect impact of the INCREASED POPULATION would cause environmental effects on other resource values, e.g., increased recreational use, which would cause soil erosion, destroy vegetation, disturb wildlife, etc." (EIS); and

WHEREAS "the populations of most game animals, large raptors, and numerous other species would be reduced over a 100 mile radius..." (EIS); and

WHEREAS more than 930 acres of vegetation and soils surrounding the plant would be affected by acid deposition by the drifts of smoke from the cooling towers, which would use Colorado River water noted for its salinity, with resultant killing or stunting of much of the natural vegetation in the area; and

WHEREAS the plant and mine would consume approximately 50,000 acre-feet of water annually, in a chronically water-short region, precluding its use for agriculture, recreation, watershed and other purposes, most of which would be SET OUT TO DRY UP IN EVAPORATION POUNDS; and



Exhibit B

Comment letters received after closing date of public response period
(from November 17 through December 31, 1975).





United States Department of the Interior

BUREAU OF INDIAN AFFAIRS
WASHINGTON, D. C. 20245

146

DO NOT REPLY TO THIS
Trust Facilitation
BQ

NOV 17 1975

Memorandum

To: State Director
Bureau of Land Management
Salt Lake City, Utah

Acting Deputy Director, Office of Trust Responsibilities - BIA

Subject: Comments on Draft Environmental Statement for the Proposed
Kaiparowits Project (DES 75/43)

Our review of the Kaiparowits Project environmental statement has identified certain portions which involve Indian lands under the jurisdiction of this Bureau. Transmission lines crossing the Navajo, Kaibab, Hualapai, Aqua Caliente, and Morongo Indian Reservations and microwave stations at Copper Mine, Preston Mesa, and Honecapi are located on Indian trust lands.

The situation with regard to Indian land rights-of-way acquisition is satisfactorily reflected in the statement on page I-156 of Chapter I. It also appears that the proposed action or alternates will not have a significant adverse effect on the Indian lands involved. Benefits to the tribes will be rights-of-way payments for those portions of the transmission line crossing their lands, and employment of a certain number of Indians in construction activity.

William H. Bryan



Save Energy and You Serve America!

IX-775



ECOLOGY CENTER OF SOUTHERN CALIFORNIA

project of Educational Communications, Inc.

2315 WESTWOOD BOULEVARD • SUITE E • LOS ANGELES CA 90064 • (213) 475-1619

MAILING ADDRESS
POST OFFICE BOX 24388
LOS ANGELES, CALIFORNIA 90024

November 13, 1975

Mr. Paul Howard
State Director,
Bureau of Land Management
U.S. Department of the Interior
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

The Ecology Center of Southern California submits herewith our comments on the draft Environmental Statement for the Kaiparowits Power Project.

The Ecology Center is a non-profit, environmental clearinghouse and coordination organization serving Los Angeles and Orange Counties. The focus of our attached comments, therefore, is directed toward impacts that would affect residents of southern California in their use of the scenic and recreational resources of the impacted southern Utah area. In addition, an important concern of the Center is the export of adverse environmental impacts that follows the import of electrical energy to southern California as a consequence of participation by Southern California Edison and San Diego Gas & Electric Company. It is necessary for load centers, such as Los Angeles and Orange Counties, to moderate growth in energy demand so that environmental impacts 400 miles away—in a nationally recognized scenic recreational and largely undeveloped area of the southwest—will not be necessary.

Very truly yours,

ECOLOGY CENTER OF SOUTHERN CALIFORNIA
Kaiparowits Project Task Force:
Jim Laprovote, Energy Coordinator
Joshua Harrison, Issues Coordinator

by

Rancy S. Pearlman
RANCY S. PEARLMAN
Executive Director

NSP:je

COMMENTS OF THE ECOLOGY CENTER OF SOUTHERN CALIFORNIA ON THE KAIPAROWITS POWER PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT

Project Rationale

The major rationale for the Kaiparowits Power Project is the alleged "need" for the additional electrical energy in major load centers of southern California. Southern California Edison Company (SCE) with a 40 percent minimum participation and San Diego Gas and Electric Company (SDG&E) are the principal beneficiaries of this project. Because the energy will be consumed largely within southern California and because the Ecology Center of Southern California serves the SCE and SDG&E service areas, our analysis of the "need" issue will focus on these two utilities.

The information presented in the Draft Impact Statement is seriously deficient in its estimation of future electrical energy demand for the SCE and SDG&E service areas. The uncritical acceptance of utility forecasts shows a failure to independently evaluate all phases of this project. If the project can be delayed without serious disruption of energy supply to the southern California utilities' customers, then not only can the adverse environmental impacts be postponed, but most important time for energy conservation measures to take effect can be bought by such postponement.

Edison projects that per capita energy consumption will increase from 7,500 kWh to 11,500 kWh in 1985. There will be, according to SCE's forecast, a 6.8 percent annual increase in electrical energy consumption (DEIS, p. I-33). It is on the assumption that utility forecasts are correct

that the Federal Energy Administration states that it supports the project. FEA then states that utility forecasts are most credible for the present time.

A brief historical look at such forecasts will cast serious doubt upon their credibility. The utilities' *Environmental Report* of June 1973 reports the then official company forecasts: 113.4 billion kWh for SCE in 1982; 19.2 billion kWh for SDG&E in 1982. On this rationale of "need" Kaiparowits was then justified. Of course events have significantly altered all energy consumption forecasts. Mandatory and voluntary conservation measures have been applied and California state law requires the adoption of major institutionalized conservation measures (for example building standards are required to be adopted by the California State Energy Resources Conservation and Development Commission by July 1977 and that agency is to study restructuring of electricity rates to effect conservation). See California Public Resources Code §§ 25402, 25403. Now projection of utility service area demand is significantly down, even by their own projections. Using utility submissions, the California Public Utilities Commission (CPUC) said demand for 1982 in SCE and SDG&E areas would be only 80 billion kWh and approximately 14 billion kWh respectively. See (California) Public Utilities Commission, *Ten Year Forecast of Electric Utilities Loads and Resources*, (General Order 151), May 19, 1975. Notice the significant downgrading of the "need" forecast in only two years.

The most important work on electrical energy demand has been done by the California State Energy Resources Conservation and Development Commission, the agency charged under state law with certification of electrical power plants and forecasting demand (in addition to the conservation functions mentioned above). Speaking of the Southern California Edison forecast (which is the most advanced of the utilities), the staff of that agency

called attention to the "significant ambiguities" in the forecast methodology and the failure to include all variables, mentioned by the company as important, in the forecast data itself. ERCA/DC, Forecasting and Assessments Division, *An Independent Staff Analysis of the C.P.U.C.'s Report on Ten-Year Forecasts of Electric Utilities' Loads and Resources*, September 2, 1975, p. 43. For SDG&E the Energy Commission staff was equally, if not more uncomplimentary. They found "major shortcomings" in the forecast model, *ibid.*, p. 54.

The actual projected demand figures themselves, when thoroughly evaluated by independent analysts, are significantly too high and cast substantial doubt on the need for this additional generating capacity in the 1984-85 time frame. Forecasts which explicitly recognize effects of mandatory conservation measures which the California Energy Commission will be required to implement show drastic reductions in demand from that forecast by SCE and SDG&E. Speaking of statewide demand Commissioner Ronald Doctor said:

California's electric utilities have plans (and need) to construct 19,000 MW of new generating capacity between now and 1984. According to the conservation forecast, however, only 8,500 MW of new capacity are required (fn) If, in addition to conservation, actual population growth approximates the Department of Finance E-0 rather than the D-100 population projection, then only 5,800 MW of new capacity would be required.]. If this forecast is valid, then the capacity additions currently planned for completion between 1980 and 1984 could be deferred until sometime after 1984. The economic benefits of being able to defer these capacity additions are significant. Deferred capital requirements would range between \$6-10 billion, depending on the type of capacity deferred. (California Energy Resources Conservation and Development Commission, *In the Matter of: Public Utilities Commission Staff's Ten-Year Forecast*, etc. Docket No. 75-POR-5, Concurring and Dissenting Opinion of Commissioner Doctor, September 6, 1975, p. 5.) [Emphasis added.]

The difference between this conservation forecast and the "official" one used by CPUC based on utility submissions is striking: In the SCE service

area for 1982 there is more than a 9 billion kWh difference; for 1984 more than 11 billion kWh difference. *Opinion of Commissioner Doctor, supra*, Figure 2B, p. 25.

In an even more recent study of demand the Forecasting and Assessments Division of the Energy Commission found, without considering any mandatory conservation measures but including price induced conservation, that:

Although our average annual growth rate of 4.22 [note how this contrasts with the SCE growth projection of 6.82] for requirements is only .5 percentage points below the 4.7% growth rate forecasted by the CPUC, our energy requirements forecast of 2,5,653 million kilowatt-hours for 1984 is 12.12 below the CPUC forecast Our average annual growth rate of 3.7% for peak load is substantially below the 5.10% rate forecasted by the CPUC; our 1984 peak load forecast of 39,941 megawatts for 1984 is 15.8% below the . . . CPUC. Therefore, 7,499 megawatts less generating capacity will be needed in 1984. [Emphasis added.]

The report then concluded that because no mandatory conservation effects were included in the forecast, "it should be considered to be the maximum forecast of electricity loads and requirements that we expect by 1984." See, *Forecast of California Electricity Requirements and Peak Load: 1975-1984*, October 24, 1975.

The substantial body of evidence reported above leads to the conclusion that as a necessity to avoid disruption to SCE and SDG&E customers, the Kaiparovits Project cannot be justified. If it is needed at all, that need should be established by explicit policy trade-offs between other generating technologies; for example, SCE just announced the indefinite postponement of its Huntington Beach Combined Cycle additions (1416 Mw). The serious question should be asked: "Why postpone a project serving and impacting consumers in the southern California area, when the company proceeds with a project that will provide less

electricity and impact an area 400 miles away?" 1/

The Impact on Natural Environment

In one of the most cavalier statements ever to appear in an impact report, we are told that "a small coalition of resident and non-resident conservationists would be disappointed if the project were approved." (DEIS, p. III-11) The people who enjoy the natural and scenic values of the southern Utah/northern Arizona region are neither a "small coalition" nor are they entirely made up of a recognizable segment of "conservationists". A recent poll sponsored by the Federal Energy Administration found that a clear majority of the nation-wide sample opposed the development of power plants which would degrade the air quality of presently clean air regions.

There are presently six operating coal-burning plants with an actual or potential capacity of 800 Mw or greater within 200 miles of the proposed plant. Within these same 200 miles are situated fully 37 National Parks, Monuments, and Recreation areas--fully 1/5 of the entire National Parks System. The park system is vitally necessary for the present and future recreational needs of this country. The statement admits that an unavoidable adverse impact will be "deterioration of air quality." (V-1) Furthermore "the addition of fine particulates and the conversion of sulfur and nitrogen oxides to aerosols would result in reduced visibility. Periodic yellow-brown atmospheric discoloration . . . would be produced." (*Ibid.*) In other words--smog--the very thing so many

1. There are valid considerations that would argue against expansion at, for example, Huntington Beach; yet there has not been a systematic evaluation of these trade-offs in a regulatory context. The basic contention of the Ecology Center is that where already degraded areas--which are near to the population served by the plant--can be used to produce the power plants should be sited there.

southern Californians go to units of the National Park System to avoid, would--by approving Kaiparowits--also greet them as they used the recreational resources of the area. Kaiparowits has been misclassified by the Department of the Interior as a Class II air quality designation. The Bureau of Land Management has recognized that the Kaiparowits Plateau is a potential primitive area. Therefore it should be considered Class I and no project should be allowed that would violate standards for such a designation. The proposed project, however, would violate those standards. As the statement says: "The probability exists that the plume from the proposed plant would violate the Class I designations of these areas. Should these areas be designated as Class I, then the final EIS will discuss the implications of severe air quality deterioration." What is needed is not to further discuss implications of air quality deterioration, what is needed is not to approve any projects that would significantly degrade the quality of existing clean air regions.

In addition to the air quality impact, the impact upon tourists and others enjoying Bryce Canyon National Park has not been fully assessed. Thirty round-trips per day through the Park will be required, the effect on traffic patterns and safety will be considerable but apparently have not been considered among the projects impacts in the DEIS.

Conclusion

The need for this project has not been demonstrated by reliable forecasts. Using the best information available considering conservation and non-conservation demand moderating effects, forecasts of the California Energy Commission show that Kaiparowits is not necessary to serve the southern California market area--at least in the time frame proposed.

Moreover, the time gained by the lesser demand should be used not to plan further coal-fired projects in the southwest, but to institutionalize demand moderating measures so that energy use in southern California can be accommodated by energy generated there. The marginal increase in air pollution that would result from such a strategy in southern California is, from a policy standpoint, more than outweighed by the value of retaining high air quality in an important national scenic and recreational resource area.

Subjecting fully one fifth of the National Park System, including some of its most famous jewels, such as Bryce Canyon, to the massive ecological degradation inherent in the impact of this plant--the visible air pollution in formerly pristine air, the lowered watertables and increased erosion and population pressure--is extremely poor planning and an unconscionable environmental impact.

* * * * *



STATE OF NEVADA
GOVERNOR'S OFFICE OF PLANNING COORDINATION
CAPITOL BUILDING, ROOM 403
CARSON, NEVADA
CARSON CITY, NEVADA 89710
(702) 895-4868
November 20, 1975

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MIKE O'CALLAGHAN
GOVERNOR

STATE OF NEVADA
DIVISION OF
COLORADO RIVER RESOURCES

P.O. Box 19090
LAS VEGAS, NEVADA 89119
TELEPHONE (702) 733-7755

October 1, 1975



DONALD L. PAPP
ADMINISTRATOR



149

Memorandum

To: Bruce Arkell, State Planning Coordinator
From: Administrator, Division of Colorado River Resources
Subject: Division of Colorado River Resources Comments on the Kaiparowits Draft Environmental Impact Statement

Mr. Paul L. Howard
Utah State Director
Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

Re: Kaiparowits Environmental Impact Statement - SAI NV #76800010

Dear Mr. Howard:

The Nevada State Clearinghouse has completed review of subject EIS. The primary concern of the State of Nevada is that new power transmission lines should utilize existing transmission corridors, especially in areas such as Clark County where numerous such corridors bisect the area. Therefore, transmission corridors related to this project should utilize existing corridors. Since the "preferred alternate" would open a new corridor through the northern portion of the Eldorado Valley Development Area, we believe you should propose an alternate alignment which will be based entirely upon existing corridors through the state.

Because of the major responsibilities of the Division of Colorado River Resources, it is felt that they should be listed as a direct contact on page IX-7.

A substantial number of questions were raised by Environmental Protection Services. These questions are attached and should be answered directly by letter to Environmental Protection Services, with a copy to this office for our files.

Sincerely,

Bruce D. Arkell
State Planning Coordinator

BDA/db
enc

cc: Environmental Protection Services
Department of Fish and Game
Colorado River Resources

We understand that a forty-five day extension has been made for receiving comments on the subject draft. We are therefore sending these comments to your office directly so that you may appraise and forward them to the appropriate Bureau of Land Management office.

The Division of Colorado River Resources has the following brief comments to make concerning the proposed Kaiparowits power generating project draft Environmental Impact Statement:

1. We believe that there should be additional explanation and identification of mitigating measures regarding possibilities of Colorado River quality degradation after the life expectancy of the plant when there is no maintenance of the fly ash, mine, and blow-down evaporation disposal sites.
2. We would suggest that the environmental statement reflect this Division's authorities in the Eldorado Valley and Fort Mohave Development Areas. The State of Nevada has the option to purchase these areas pursuant to Public Laws 85-339 and 86-433, respectively. In this regard we believe that this Division should be listed as a direct contact on page IX-7 of the statement.

Memo to State Planning Coordinator
Re DCRS Comments on Kaiparowits
Draft EIS

October 1, 1975
Page 2

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We note that the "Northern Kaiparowits-Mohave
500 KV Transmission Line Preferred Alternate"
would open a new corridor through the northern
portion of the Eldorado Valley Development
Area. We believe that such a new corridor
must be subjected for approval by this Division.

Donald L. Paff
Donald L. Paff

cc: Mr. Rimo J. DeRioco
Director
Department of Conservation
and Natural Resources
Nye Building
201 S. Fall Street
State of Nevada - Capitol Complex
Carson City, Nevada 89710

18-781



September 9, 1975



MEMORANDUM

TO: Bruce Arkell

FROM: Jack Sheen *Jack R. Sheen*

SUBJECT: Draft EIS: Kaiparowits

Comments

Air Quality Control - 1. Is the 90% removal of SO₂ legally binding?

2. Will there be any impact from the water formation due to the combustion?

3. How much water will be formed due to combustion?

4. Will the waste gas stream be reheated to eliminate the visible steam plume?

5. There should be an ambient air network around the site. A minimum of five (5) sites. This is especially true because of the major difference between the NOAA and Intertec models.

6. Sampling sites and equipment should be selected by the developer and concurred in by the State of Utah and EPA.

7. The sampling sites should be operated at least five (5) years after full operation.

8. The sampling sites should contain continuous monitors for SO₂, NO₂, NO_x and particulates.

9. Emission from off-road vehicles and unpaved roads were not considered.

MEMORANDUM

Bruce Arkell
September 9, 1975
-2-

Solid Waste Management - No comments.

- Water Quality Control -
1. Some provision should be agreed upon for maintenance of storm water controlling structures after the life of the project to prevent the ash disposal site and accumulated salts from the evaporating ponds from entering Lake Powell.
 2. Is any water quality sampling of perennial surface waters in the impact area being now carried out? Such data will provide background information after the project is initiated to assess the function of storm water control devices, blasting at the Limestone Quarry, and urban runoffs from new paved roads and the new town.
 3. Could the storm runoff water in a "clear water pond" (which should be equal to or better than ground water) be used to replace that lost from Tom Best Spring and Reynolds Spring should the water table drop as a result of the Quarry Project?
 4. What percentage increase in ground water salinity can be expected if mine and quarry blasting, subsidence, and changed flow characteristics allow an interface between fresh ground water and saline surface waters?

149



1100 VALLEY ROAD P.O. BOX 10678 RENO, NEVADA 89510 TELEPHONE (702) 784-6219

GLEN K. GRIFFITH
DIRECTOR

MIKE O'CALLAGHAN
GOVERNOR

September 2, 1975

Mr. Bruce D. Arkell
Planning Coordinator
Governor's Office
Capitol Building, Rm. 57
Carson City, Nv. 89701

Dear Mr. Arkell:

Reference is made to Kaiparowits Project SAI 76800010. The Department of Fish and Game has no base objection to the Kaiparowits project as it relates to the State of Nevada since the proposed transmission line will parallel existing lines from the Mohave Power Generating Plant to California.

It is highly recommended that any power transmission lines crossing the State of Nevada follow existing power corridors. From the number of such lines that have been proposed or discussed, if these are not held to existing corridors, could result in a maze of lines creating a "hodgepodge" of unnecessary environmental destruction.

Sincerely,

GLEN K. GRIFFITH, DIRECTOR

By: *[Signature]*
A. Jack Dieringer
Assistant Chief
Division of Fisheries

AJD:vh

IX-782

JS/dp

MOHAVE COUNTY BOARD OF SUPERVISORS

P.O. BOX 390 • KINGMAN • ARIZONA 86401

SUPERVISOR
DONALD R. ALDRIDGE
District 1

SUPERVISOR
JAMES H. HOWELL D.D.S.
District 2

SUPERVISOR
W. A. JENSEN O.D.
District 3



150

November 19, 1975

The Honorable Thomas S. Kleppe
Secretary of Interior
Department of the Interior
18th and C Street
Washington, D. C. 20240

Re: Kaiparowits to Eldorado Transmission
System, Kaiparowits Power Plant

Dear Mr. Kleppe:

The Mohave County Board of Supervisors respectfully submits the following comments and resolution concerning the Kaiparowits to Eldorado transmission system for the proposed Kaiparowits Power Plant.

The Board of Supervisors held a public hearing on November 17, 1975, concerning the Arizona Strip Alternate to the transmission system linking Kaiparowits to Eldorado. During the hearing the public strongly opposed the Arizona Strip Alternate. The reasons cited by the public include: 1) This alternate will put twin 500 KV overhead transmission lines through one of the most primitive and scenic lands which remain in the West; 2) it will be near the Bureau of Land Management's new Paiute Primitive Area; 3) it could destroy a potential habitat for desert big horn sheep and antelope; and 4) it would intrude upon the high scenic quality of the land and new roads would open up, otherwise, remote areas.

It has been the policy of this Board to encourage the use of existing corridors for the accommodation of new facilities.

In addition, we strongly object to the piecemeal approach being taken by the B.L.M. and other federal agencies involved in energy resource development. It is our understanding that the Environmental Impact Statement on the Navajo-McCulloch project recommended a regional energy resource development plan. To our knowledge such a plan has not been developed.

We realize the future will bring additional transmission facilities throughout the County. If such a plan were developed corridors could be

11/19/75

studied and designated that could be fully utilized while minimizing unnecessary environmental degradation. We believe this is the only way energy needs will be met without destroying the sensitive environmental areas. We strongly urge the formulation of regional energy resource development plans and policies.

On behalf of the Board of Supervisors, thank you for the opportunity to comment on this most important project.

Sincerely,

MOHAVE COUNTY BOARD OF SUPERVISORS

James H. Howell, D.D.S., Chairman

JHH:lir

Enclosure: Resolution

cc: Senator Paul Fanin
Senator Barry Goldwater
Representative Sam Steiger
Governor Raul Castro
Paul L. Howard
Robert Buffington
William D. Goodale

IX-783

WHEREAS, the Mohave County Board of Supervisors met in Special Session this 17th day of November, 1975;

WHEREAS, the proposed Kaiparowits Transmission System, which is part of the Kaiparowits Project is proposed to be constructed through the "Strip Area" of Mohave County, and

WHEREAS, the County has received and reviewed the draft of the Environmental Impact Statement for the project, and

WHEREAS, the Board of Supervisors held a public meeting, on November 17, 1975, concerning this project, and

WHEREAS, it has been the policy of Mohave County to encourage new transmission lines to follow existing corridors, and

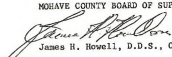
WHEREAS, the Strip country of Mohave County is one of the most remote areas in the continental United States and a valuable untapped natural resource to Mohave County and the State of Arizona, and

WHEREAS, be it resolved that it is the opinion of the Board of Supervisors that construction of the proposed project in the existing McCulloch 500 KV (L.A.D.W.P.) corridor will present fewer negative environmental impacts as opposed to the Arizona Strip Alternate route, and

NOW THEREFORE, BE IT RESOLVED, that the Board of Supervisors strongly recommends that the Secretary of Interior designate that the existing Navajo-McCulloch KV 500 (L.A.D.W.P.) corridor be utilized and deny permission to construct the proposed project along the Arizona Strip Alternate route.

PASSED, APPROVED AND ADOPTED this 17th day of November, 1975.

MOHAVE COUNTY BOARD OF SUPERVISORS


James H. Howell, D.D.S., Chairman

ATTEST:


Gail Kesler, Clerk

OFFICE OF
ECONOMIC PLANNING AND DEVELOPMENT

MAILING ADDRESS: 1645 West Jefferson • Room 428 • Phoenix, Arizona 85007

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COMMENTS CONCERNING
THE
KAIPAROWITS POWER PROJECT
DRAFT ENVIRONMENTAL IMPACT STATEMENT
BY THE
ARIZONA DEPARTMENT OF HEALTH SERVICES

November 3, 1975

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November 21, 1975

Mr. Paul Howard, State Dir.
Department of the Interior
Bureau of Land Management
Post Office Box 11505
Salt Lake City, Utah 84111Re: Project Title: Draft - Kaiparowits Power Project
State Application Identifier: 75-80-0035

Dear Mr. Howard:

Enclosed is a copy of responses received concerning the above project
which was received by us after our signoff to you on September 25, 1975.

Sincerely,

Ralph Kingery
Arizona State Clearinghouse

RKH:h

Enc.

Because of the close proximity of the proposed Kaiparowits power plant to the northern border of the State of Arizona and to the existing Navajo power plant located near Page, Arizona, the Arizona Department of Health Services closely studied the Kaiparowits Power Project draft environmental impact statement. As the result of this study the following comments are offered. In addition information that may not have been available to the Bureau of Land Management during the preparation of the draft environmental impact statement is included.

Air Quality

There are a number of uncertainties regarding the basis of the evaluation of the environmental impact of the proposed project. Principal concern is the lack of or improper consideration that four additional coal-fired power plants are proposed for construction in the vicinity and that an existing power plant (Navajo) with two units already in operation and another nearing completion is only 30 miles to the south. The combined impact of the proposed and existing plants upon the ambient air has not been evaluated. The Kaiparowits impact on air quality appears to be based upon the assumption that background pollutant levels are zero. Such background concentrations certainly are not the case now, and with the construction of additional power plants in the area, will certainly increase.

Monitoring of air quality near the Navajo power plant at Page, Arizona by the Arizona Department of Health Services began in 1969. Good background data exist for particulate, nitrogen dioxide, and sulfur dioxide ambient air

IX-785

concentrations prior to start-up of the Navajo plant---i.e. 1969 through 1973. Air quality data are presented in Table I and Figure 1, attached.

Annual geometric mean particulate concentrations increased from 17 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) in 1969 to 52 $\mu\text{g}/\text{m}^3$ in 1973 and then leveled off at 48 $\mu\text{g}/\text{m}^3$ in 1974. This trend is believed to reflect population growth and construction activities associated with the Navajo Power Plant from 1969 to 1973. Units 1 and 2 of the plant became operational in 1974. It should be noted that the Arizona standard for particulates is 60 micrograms per cubic meter annual geometric mean.

Annual sulfur dioxide and nitrogen dioxide concentrations increased from 1 and 10 micrograms per cubic meter, respectively, in 1973 to 8 and 24 micrograms per cubic meter in 1974. These increases resulted from operation of the plant in 1974. As a matter of information, the Arizona standards for SO_2 and NO_2 are 50 and 100 micrograms per cubic meter annual average, respectively.

Though not yet published, preliminary evaluation of a joint EPA/Salt River Project study concerning air quality in the vicinity of the Navajo plant indicates that violations of State of Arizona ambient air standards will not occur except under upset or episode conditions. However, the State standards will be approached under certain meteorological conditions.

The chemical composition and concentration of specific constituents in particulate matter is also monitored by the Arizona Department of Health Services. Data for particulates near Page, Arizona are included in Tables II (1969), III (1972), IV (1973), and V (1974). No monitoring was performed in 1970 or 1971.

There have been numerous observations by staff members (engineers and technicians) of the Bureau of Air Quality Control of a yellow-brown haze in the vicinity of the Navajo power plant. Dates for such observations are not available. Since no control of nitrogen oxides emissions is proposed for

Kaiparowits, incidence of brown haze from nitrogen dioxide will undoubtedly become commonplace throughout the area.

Electrostatic precipitators are used at the Navajo power plant to reduce particulate emissions. Sulfur dioxide and nitrogen oxide emissions are not controlled. Therefore, when all three units are operational, emissions rates for the Navajo plant are:

	<u>Tons per Day</u>
Particulates	7.25
SO_2	230
NO_x	280

As noted in the draft environmental impact statement, Kaiparowits emissions will be:

	<u>Tons per Day</u>
Particulates	12.2
SO_2	34.3
NO_x	250.0

Even if emission controls are as effective as specified, the accumulative effect of emissions from these two sources will cause rapid degradation of the existing air quality. National ambient air standards would possibly be exceeded in areas distant from the plants.

Air quality standards should not be "goals" but should be maximum limits to afford protection.

Meteorology

Meteorological analyses by the Bureau of Air Quality Control show that air quality in the Lake Power Basin will be adversely influenced by the Kaiparowits emissions. The combined effect of these meteorological factors is unknown quantitatively; however, a definite potential exists for a reduction of visibility in northern Arizona.

There are two synoptic weather patterns each with differing mixing depths and wind direction which exist in the area--summer and winter. Winter months are the most severe and have the lowest mixing depth. In January, a mean mixing depth at Page, Arizona is less than 2000 feet with weakly defined wind patterns and locally influencing topographic effects.

The air drainage for the Colorado River basin under a wintertime high pressure air mass is to the south or southwest. These high pressure systems are frequent and represent limited or no dispersion, resulting in stagnation.

The Lake Powell basin and the Navajo generating station are surrounded by higher terrain except to the northwest. The North American Weather Consultants Navajo Plant Site wind study showed a nighttime surface drainage to the south-southeast at 7 to 9 miles per hour and at a depth of less than 100 feet. Daytime winds show an unorganized thermal influence associated with a north-west wind to an altitude of 900 feet. Above 1000 feet and becoming well defined at 4000 feet, the wind pattern is southwest.

A summary analysis of the Four Mile Bench site for various meteorological stability classes based upon best available data indicates that, for an effective stack height of 7600 feet above mean sea level, most inversions will occur below this altitude and that downward mixing of the plume will be prevented. Thus, for these winter conditions and with winds from the northerly quadrant occurring 40 percent of the time at the effective stack height, air transport will be over the Lake Powell basin and Northern Arizona.

Turbulence over the Four Mile Bench site may enhance neutral or slightly unstable conditions where normal Pasquill stabilities would indicate stable conditions. However, with accompanying ground level concentrations over the flat terrain of Lake Powell and little or no afternoon inversions, NO_x and particulates can be assured a transport with associated visibility reduction.

Late nighttime and early morning neutral or slightly stable conditions can result in drainage into the Lake Powell basin with any of numerous meteorological instability conditions.

Significant Deterioration

The draft environmental impact statement included minimal discussion of the significant deterioration of air quality. This should be expanded since deterioration of the air quality in this region can drastically affect many national parks, monuments, and recreational areas as well as other scenic wonders which abound in the area.

It should be noted that Arizona State Rules and Regulations for Air Pollution Control require that measures be taken to prevent deterioration of air quality. The rule is a portion of the State's ambient air quality standards and is as follows:

¹⁹9-3-208 Anti-degradation

These standards shall not be construed as permitting the preventable degradation of air quality in any area of the State."

The NOAA and TVA predictive SO_2 diffusion models, used in conjunction with Pasquill Stabilities Class C and D and supportive smoke and oil-fog tracer studies outlined in the draft statement, result in ambient concentrations at areas of potential plume impaction to be within a significant deterioration Class II. An excerpt from the draft environmental impact statement is as follows:

¹⁹Because of the proximity of the proposed site to national forest, parks and recreation lands, with their potential for re-designation as Class I areas, in which practically any change in air quality is considered significant, the probability exists that the

plume from the proposed project would violate the Class I limitations of these areas. Should these areas be designated as Class I, then the final environmental impact statement will discuss the implications of significant air quality deterioration."

The proximity of the proposed site to these areas may make any industrial pollution unacceptable. Even if incremental increases in air pollution are permitted, it may be limited to impacts comparable to those in Class I for significant deterioration. Therefore, a re-evaluation of the projected air quality levels and the impact of the federal significant deterioration regulations may be necessary.

Plant Operation

Operating experience of the particulate emissions control equipment at the Navajo power plant has been closely monitored. This information is included to indicate the operation of a power plant of size similar to the proposed Kaiparowits plant:

1. The efficiency of the electrostatic precipitators associated with Units 1 and 2 when "tuned" for compliance testing was 99.6 percent. Under "normal operation" the efficiency has been 99.1 percent removal of particulate matter.
2. Availability of the control equipment has been 97 percent. The three percent downtime is not due to malfunction of the precipitators but due to malfunction of the boilers and their re-start-up. The precipitators are not put in operation until the boilers have reached 20 percent of their capacity. This start-up procedure takes 4 to 5 hours and 40 such start-ups have occurred since January 1, 1975.

3. Unit 3 of the Navajo plant is completed except for shake-down, testing, and adjustment. Actual power generation is anticipated to begin in the next two or three months. Commercial operation would follow shortly thereafter.

It should be noted, however, that the Arizona Department of Health Services has observed that provisions contained in proposed environmental impact statements or compliance plans are not always followed in actual practice. Developers have discovered means to retreat from original control plans after the impact statements have been approved.

In the Navajo power plant final Environmental Impact Statement of February 4, 1972, the participants committed themselves to installing SO₂ removal systems on all three units, specifically stating, "SO₂ removal equipment will be installed on all three units and will have a design efficiency of not less than 50 percent reduction of SO₂".

A number of air quality impact studies have since been conducted which were sponsored by the participants of the Navajo Generating Station Project. These studies basically indicated that SO₂ control equipment was not necessary; the latest, "Navajo SO₂ Field Monitoring Program" submitted to EPA in August 1975 negates the need for any SO₂ control system. Conclusions of that study indicate that the three-hour national air quality standard will be violated less than twice a year.

The Arizona Public Service Company Cholla power generating facility is being modified by adding Units 2 and 3. On March 5, 1973, before the Power Plant and Transmission Line Siting Committee of the State of Arizona, the Arizona Public Service Company testified that an environmental impact statement as required by the National Environmental Policy Act (NEPA) was being prepared. At this hearing, Arizona Public Service Company committed itself to two alternates for air quality control for Cholla Units 2 and 3. Both

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these alternatives would utilize sulfur dioxide removal equipment employing limestone slurry absorbers, which would have been capable of removing 75 percent of the gaseous SO₂ content when 1.2 percent sulfur coal is fired.

This air quality control system for Cholla Units 2 and 3 was proposed to and accepted by the Arizona Bureau of Air Quality Control, and an overall installation permit for construction was issued on July 1, 1973. The system was designed to remove more than would be required by the most stringent emission regulations.

In January 1975, Arizona Public Service Company submitted applications for operating permits for the air quality control equipment for Units 2 and 3. This application indicated a major change from the previous plan--i.e. no SO₂ control equipment for Unit 3. The plan was to scrub Unit 2 and combine the flue gases from Units 2 and 3. The State Bureau of Air Quality Control is now in the process of granting Arizona Public Service a permit with these modifications since the proposed operation would not violate Arizona standards.

Should the Kaiparowits Power Project be approved, any proposed controls included in the impact statement should be implemented, considered binding, and not subject to future arbitration or bargaining.

Conclusion

The Arizona Department of Health Services believes the proposed Kaiparowits Power Project, in conjunction with the operation of other existing or proposed power plants in the area, would create an unreasonable burden on the air quality of the region. This area is virtually the center of some of nature's greatest monuments. All measures should be taken to maintain the existing natural beauty which is now a source of national pride.

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Therefore, it is the recommendation of the Arizona Department of Health Services that the environmental impact statement for the Kaiparowits Power Project be expanded to include the cumulative impact of existing and proposed power plants on the air quality of the region. It is hoped that the additional information presented herein will be of value during such a re-evaluation.

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Table 1
Air Quality Data for Page, Arizona
(concentrations in $\mu\text{g}/\text{m}^3$)

Total Suspended Particulates

Year	Annual Geometric Mean
1969	17
1970	Insufficient Data
1971	No Data
1972	31
1973	52
1974 ^a	48

Nitrogen Dioxide

Year	Annual Average	Maximum 24-Hour Average
1973 ^b	10	49
1974 ^a	24	132

Sulfur Dioxide

Year	Annual Average	Maximum 24-Hour Average
1973	1	11
1974 ^a	8	22

- a. Navajo Power Plant #1 unit started up February 1, 1974; #2 unit started up December 2, 1974.
b. Sampling method modified in October 1973.

MOC:jb
9/19/75

Figure 1

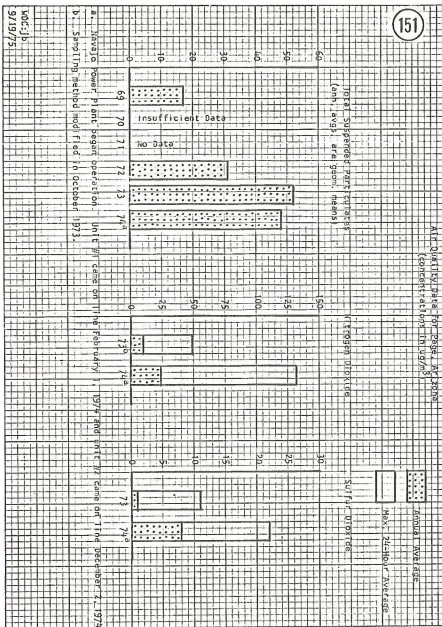


Table III
1972 SPECIFIC CONSTITUENTS OF PARTICULATES DATA
(Averages in micrograms per cubic meter)

	Benzene Soluble Organics	Nitrates	Sulfates	Arsenic	Bismuth	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Tin	Titanium	Vanadium	Zinc
Ajo	1.6	1.1	5.3	.359	.007	.002	.003	.004	.28	1.1	.5	.02	.0002	.002	.00	.00	.00	.18
Clearlake	.5	.8	1.8	.001	.002	.001	.010	.019	.21	1.4	.2	.03	.0002	.003	.00	.00	.00	.21
Claypool	3.6	1.1	8.2	.014	.019	.009	.011	.015	1.50	2.3	1.0	.13	.0001	.014	.01	.00	.00	.82
Coffey	1.1	1.0	5.9	.002	.008	.004	.001	.013	.12	.5	.1	.01	.0002	.008	.00	.00	.00	.27
Donner Pass	2.7	1.9	8.1	.016	.007	.012	.001	.028	1.77	3.4	1.1	.08	.0008	.032	.01	.00	.00	.45
Flintstaff	2.5	.5	2.1	.000	.004	.000	.000	.013	.06	.8	.4	.03	.0002	.010	.00	.00	.00	.01
Flintstaff	1.7	1.9	5.5	.010	.003	.005	.002	.030	.53	3.4	.4	.15	.0003	.020	.00	.00	.00	.02
Holbrook	3.2	.6	3.2	.001	.001	.001	.020	.041	.00	1.6	.3	.32	.0001	.016	.00	.00	.00	.11
Joseph City	1.2	.7	2.7	.001	.002	.001	.003	.007	.07	1.9	.0	.01	.0000	.024	.00	.00	.00	.11
Marathon	1.1	.8	1.9	.001	.000	.001	.003	.002	.00	.00	.1	.02	.0001	.012	.00	.00	.00	.14
Castle	.8	.9	2.6	.000	.004	.001	.002	.013	.07	.7	.1	.02	.0002	.016	.00	.00	.00	.71
Organ Pipe	.7	1.0	3.1	.008	.007	.001	.001	.020	.18	.8	.1	.02	.0002	.016	.00	.00	.00	.71
Pack	.7	.6	2.1	.000	.005	.000	.000	.000	.10	1.3	.1	.01	.0001	.010	.00	.00	.00	.11
Pack Spur	1.2	1.0	4.3	.004	.008	.002	.002	.007	.16	3.0	.5	.06	.0001	.009	.01	.00	.00	.14
Pack Spur	1.3	1.2	2.4	.001	.000	.000	.001	.006	.20	.8	.1	.02	.0001	.020	.00	.00	.00	.22
Tuba City	1.3	.8	2.9	.000	.001	.001	.003	.003	.09	1.5	.1	.02	.0001	.017	.00	.00	.00	.11
Winslow	1.9	1.4	2.3	.000	.001	.000	.004	.016	.04	.1	.2	.04	.0001	.017	.00	.00	.00	.11

Note: Analyses for the elements were usually run on every fourth sample.

Table II

1969

SPECIFIC CONSTITUENTS OF PARTICULATE MATTER
Arithmetic Mean in Micrograms per Cubic Meter

	SUPERIOR	SAN MARCEL	PAIGE	ORGAN PIPE	HAYDEN	FLORENCE	E. PLANTERITE	DOUGLAS	DAVIS DAM	CLAYPOOL	AJO
Benzene Sol.	3.2	1.6	1.4	1.0	5.6	3.6	2.0	10.4	1.4	5.5	2.9
Nitrates	.4	.5	.5	.5	1.0	2.6	2.6	.7	1.2	.8	.9
Sulfates	7.8	6.2	.2	6.1	40.7	12.9	10.1	9.4	3.4	13.0	8.1
Arsenic	.01	.009	.005	.006	.007	.01	.004	.004	.001	.003	.003
Cadmium	.019	.002	.002	.002	.006	.013	.006	.011	.002	.002	.005
Chromium	.009	.005	.004	.026	.018	.018	.004	.01	.004	.007	.006
Cobalt	.002	.001	.003	.012	.009	.001	.001	.004	.004	.001	.001
Copper	.8	.7	.1	.5	5.2	.5	.5	.8	.4	.4	.4
Iron	1.2	1.0	.4	.5	1.7	1.1	1.1	2.5	.6	1.6	1.0
Lead	.5	.04	.2	.1	.3	.5	.2	.5	.1	1.2	.1
Manganese	.1	.02	.01	.01	.05	.02	.02	.02	.02	.05	.03
Moly.	.004	.003	.007	.002	.008	.008	.003	.02	.003	.001	.001
Nickel	.004	.003	.007	.012	.015	.002	.002	.008	.005	.004	.004
Zinc	1.7	.2	2.3	.4	3.4	3.9	7.9	2.8	2.7	2.8	1.8

Arizona State Department of Health
Division of Air Pollution Control

September 1970

Table IV

1973 Specific Constituents of Particulates Data
(averages in micrograms per cubic meter)

Location	Benzene Soluble Organics	Nitrates	Sulfates	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Zinc
Alto	1.0	1.9	7.2	<.001	.001	.001	.002	.02	.9	.1	.01	<.001	.04
Chickadee	3.0	1.7	11.3	<.001	.002	.002	.006	.04	.7	.1	.02	.001	.02
Cleopoli	3.0	1.7	11.3	<.001	.002	.002	.006	.04	.9	.1	.03	.001	.03
Clicton	1.0	9.6	9.6	.001	.001	<.001	.002	.002	1.6	.6	.03	.001	.03
Davis Dam	1.5	1.7	3.9	.001	.001	.001	.002	.002	.08	.1	.02	.001	.05
Douglas NNE2	2.7	7	9.1	.023	.011	.001	.002	.002	1.3	.3	.01	.001	.01
Douglas NNE3	2.7	7	3.1	<.001	.001	.001	.002	.002	.09	1.2	.4	.03	.001
Flies Creek	3.0	1.6	20.0	.018	.004	.002	.004	.002	.17	1.5	.2	.03	.001
Hayden	3.0	1.6	20.0	.016	.016	.002	.005	.004	2.94	2.8	.6	.03	.004
Kirkman	3.0	1.6	3.0	.018	.016	.002	.005	.004	2.8	2.8	.6	.03	.004
Lake Havasu City	7.7	7	3.6	<.001	.001	.001	.003	.09	.2	.1	.01	.001	.17
Monterey Canyon N.M.	7.3	1.8	3.8	---	---	<.001	.002	.14	.5	.1	.01	.002	.03
Ortega Pigeon Canyon N.M.	7.3	1.8	4.8	.007	.001	<.001	.002	.14	.5	.1	.01	.002	.03
Page	7.3	1.8	4.8	<.001	.001	<.001	.002	.14	.5	.1	.01	.002	.03
Precinct	1.7	.9	3.1	---	---	<.001	.003	.06	.5	.1	.01	.001	.001
Rillito SE	2.6	1.3	8.8	---	---	---	---	---	---	---	---	---	---
San Manuel	1.7	1.2	11.4	.013	.004	.002	.003	1.71	1.6	.3	.02	.002	.12
Superior	1.9	1.0	6.5	.010	.004	.002	.005	.18	3.2	.5	.05	.002	.12
Yuma	2.3	1.7	5.4	.002	.002	.001	.002	.09	.9	.1	.02	.001	.04
Yuma	1.8	1.8	3.4	<.001	.001	.001	.002	.03	1.0	.3	.02	.001	.04

Note: Analyses for the elements were usually run on every fifth sample.

Table V
1974 Chualar¹ Composition of Particulates
(in $\mu\text{g}/\text{m}^3$)

[illegible]

estimations of nitrate, nitrite, cadmium, cobalt, vanadium, and nickel were discontinued after June 1970, since the available data were not sufficient.



United States Department of the Interior

BUREAU OF MINES
2401 E STREET, NW.
WASHINGTON, D.C. 20241

(152)

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November 24, 1975

Memorandum

To: State Director, Bureau of Land Management, Salt Lake City, Utah
Through: Assistant Secretary--Energy and Minerals NOV 26 1975
From: Director, Bureau of Mines
Subject: Draft environmental impact statement for Kaiparovits Power Project, Utah

The Bureau of Mines Intermountain Field Operation Center, Denver, has reviewed this draft environmental statement for the Kaiparovits Power Project, Utah, prepared by an interdisciplinary team under the leadership of the Bureau of Land Management. The document pertains to the planned construction of a four-unit, 3,000-megawatt, coal-fired, mine-mouth generating facility on Fourmile Bench north of Page, Arizona.

As regards mineral resources, we have no objections to the statement as written. Construction and operation of the plant would contribute to the economic welfare of the region and, in addition to facilitating the development of the coal resources of the area, may stimulate interest in other mineral resources in the region.

Paragraph 5 (page VI-6) should be revised to reflect correct usage of the word "productivity." Construction of the powerplant over a coal resource area will preclude recovery of the coal during the life of the project but will not affect its productivity. Resources are not productive until they have been recovered.

Of the seven lime/limestone processing alternatives listed in the environmental statement (page VIII-51), only six are discussed. The document should include a discussion of the seventh.

One of the principal environmental issues that receives attention throughout the environmental statement, and to which we direct our remaining comments, involves the potential impacts of trace metals released to the environment by burning coal. Specifically, there is concern that mercury contamination will severely restrict game fishing in Lake Powell. Apparently, "some" of the larger game fish already contain high levels of mercury (in excess of

500 ppb, page III-154) as a result of biomagnification/accumulation of naturally occurring background concentrations of the metal (0.01 to 0.1 ppb, op. cit.).

It would appear that impoundment of Lake Powell has created a more favorable habitat for both primary assimilators and predaceous game fish. The primary assimilators fixate mercury in compounds capable of being passed up the food chain to predaceous fish which occupy the top of the chain, and as the fish reach larger size there is a concomitant increase in their accumulated mercury. In the case of Lake Powell, biomagnification is an unforeseen consequence resulting from impoundment and the creation of a sport fishery that has been fostered in part by the introduction of more desirable species (appendix II-16). In short, the promotion of a sport fishery occasioned by impounding the lake has created a two-edged sword: large desirable game fish contaminated by accumulation of mercury. Nevertheless, the creation of the fishery has focused attention on the problem of bioaccumulation, and has fostered a concern that small additions of mercury generated by the proposed powerplant may further contribute to the deterioration of the fishery.

In light of the history of the controversy surrounding mercury and the environment, the concern about biomagnification in Lake Powell is understandable, but other than raising the issue of amplification of baseline levels, the environmental statement presents no data to support the contention (page III-154) that emissions from the Kaiparovits powerplant may contribute materially to increased mercury levels in the lake. Such a contention is deserving of quantification, insofar as is possible, using data provided in the environmental statement as follows:

1. The concentration of mercury in the washed coal to be burned would be approximately the same as in the analyzed samples (e.g., 0.06 ppm, figure II, page II-37).
2. Thirty three thousand tons of washed coal would be burned per day (page III-31).
3. Capacity of Lake Powell is 27 million acre-feet of water (page III-155).
4. Four pounds of mercury per day would be released from the stacks (33,000 tons of coal burned per day having a concentration of 0.06 ppm mercury) and none would be captured by precipitators or scrubbers (page III-32).

Given this information and two very conservative assumptions that no mercury would be flushed from the lake during the life of the project (i.e., the lake would have no throughput) and that all mercury enters the lake immediately after leaving the stacks, mercury effluent from the plant would result in a 0.002 ppb per year increase in the level of mercury concentration in Lake Powell or 0.07 ppb over the 35-year life of the project. Although much of the

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transport of stack effluents will be directed over the lake and its contributory drainage by prevailing winds (pages II-47 & -56 and appendix II-1), and this effect will influence potential mercury additions to the lake, it seems highly unlikely that operation of the powerplant will produce the 0.002 per year or indeed a 0.07 increase in the mercury level over the life of the project. The highest figure assumes 100 percent of the mercury in the air would be deposited in the lake or its tributary drainages.

Bioamplification will probably continue as a result of naturally occurring mercury, but we wonder why substantiating data regarding this phenomenon were not included in the environmental statement as an appendix, especially in view of the concern for the problem. Although "some fish" have been identified as carrying high levels of mercury (page III-154), the phrase is vague and indefinite and we are left with no means by which to judge the validity of the "data" used to support the concern for this environmental problem.

Two corrections need to be made on mercury data provided in the environmental statement. The standard deviation for mercury concentration data supplied by Arizona Public Service, and listed in figure 11 (page II-37), appears to be in error. The deviation is larger than the mean (0.06 ± 0.07). Figure 19 lists a mercury emission rate of 24 pounds per day. This rate is equivalent to a concentration of 0.40 ppm mercury, and is in error by one order of magnitude when compared to the trace element analysis of coal in figure 11, page II-37, and appendix III-5, figure 1, page A-614.

T. V. Falke
V. Falke
Director



DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

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Dec. 2 1979

Mr. Paul Howard, State Director
Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

We have had the draft environmental impact statement for the Utah Kaiparowits Power Project reviewed in the relevant agencies of the Department of Agriculture, and comments from Soil Conservation Service and Forest Service, both agencies of the Department, are enclosed.

Sincerely,

John M. Barnes
FOWDEN G. MAXWELL
Coordinator
Environmental Quality Activities

Enclosures

Soil Conservation Service

Comments on

Kaiparowits Power Project, Utah
Bureau of Land Management

1. Page 1-20

A sentence should be added to first paragraph stating that refrigerated cooling requires 5 to 10 times as many kw-h as evaporative cooling.

2. Page 1-75

The EIS would be improved if units were given for the values listed under Ash Analysis.

3. Page 1-85, line 18

Delete word "Annual."

4. Pages III-6, 2nd paragraph; III-120, 3rd paragraph; III-128, last paragraph; and VIII-223, 4th paragraph

There would be a decreased dilution of salts rather than a concentration. Also, the data on page VIII-223 should be coordinated with the similar data on the other pages listed above.

5. Page III-72, 1st line

Strontium is toxic only in large quantities when calcium and magnesium availabilities are low.

6. Page III-78, last paragraph

Change calcium fluoride to "fluorite."

Change last sentence as follows:

High concentrations of gaseous fluorides associated with smelter operations can be deposited on vegetation and cause fluorosis in animals when ingested with the food.

7. Page III-202, line 9

Nitrogen oxides rather than nitrates are emitted. However, the nitrogen oxides are subsequently converted to nitrates.

IX-795

8. Page VIII-222

Change last word from day to "year."

9. We would recommend a detailed soil survey be made of the townsite if and when the project is approved to determine the soils limitations for various municipal uses.



DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

DEC 2 1975

Mr. Paul Howard, State Director
Bureau of Land Management
125 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

We have had the draft environmental impact statement for the Utah Kaiparowits Power Project reviewed in the relevant agencies of the Department of Agriculture, and comments from Soil Conservation Service and Forest Service, both agencies of the Department, are enclosed.

Sincerely,

John M. Barnes
HOWDEN G. MAXWELL
Coordinator
Environmental Quality Activities

Enclosures

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Forest Service Comments

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RE: DRAFT ENVIRONMENTAL STATEMENT-PROPOSED KAIPAROWITS POWER PROJECTS,
KAIPAROWITS PLATEAU, SOUTHERN UTAH

The project will affect three Forest Service Regions, headquartered at Ogden, Utah; Albuquerque, New Mexico and San Francisco, California. The comments represent the review by personnel located in all three Regions.

Page I-27, figure 10, should substitute "Coronado Station" for "Arizona Station" to reflect its new designation. Kaiparowits Project should be deleted since the Salt River Project has withdrawn.

Page I-156, first sentence refers to something "described above," there is nothing above except a heading.

Page I-161, illustration 39 shows a proposed microwave site on Santiago Peak. Santiago Peak is shown in the wrong location. It is inside the Cleveland Forest boundary. On page I-166 (Figure 30) the table shows Santiago Peak as an "existing" microwave station with no expansion. This is not correct. There is room for other facilities. This needs to be clarified and the correct location shown.

Page I-322, under section entitled "U.S. Forest Service would" add:

Grant communications sites - Act of June 4, 1897 (30 Stat. 35, as amended; 16 USC 551)

Grant special land use permits as necessary for access roads and marshalling yards - Act of June 4, 1897

Ensure compliance with laws and regulations applicable to National Forest System lands, such as the Archeological Preservation Act and Endangered Species Act

This same section brings up a point regarding the right-of-way needed across the Cleveland National Forest in California. The proposed right-of-way goes through two areas which were subsequently designated as inventoried roadless areas (Ladd and Coldwater Inventoried Roadless Areas). The only place we could locate any mention of a roadless area on the Cleveland Forest is at the top of page II-311. Before the Forest Service could issue a permit or easement for a right-of-way, the environmental statement would have to address itself to the wilderness character of the roadless area. This could be done in the final EIS on Kaiparowits or in the Forest's Land Use Plan for the Trabuco District which is now in progress and scheduled for completion in 1976.

IX-797

The Cleveland Forest has made commitments on the area for right-of-way purposes. Southern California Edison Company applied for a special use permit on March 15, 1968, to conduct a survey for a powerline. The Forest made an "Impact Survey Study for Power Transmission Lines (Stage I)" for surveying Southern California Edison Company's dual (2) 500 KV transmission lines and San Diego Gas and Electric Company's parallel 220 KV transmission line. Five routes were considered and one selected (reference Stage I Report approved by Regional Forester on 12/14/70).

As a result of the Stage I (EAR) report, the Forest issued a special use permit for surveying the proposed electric transmission line on July 15, 1971. The survey permit was for one year and was renewed on 12/7/72, 1/7/74 and 1/10/75. This is not a contractual commitment; therefore the question regarding the inventoried roadless areas needs to be expanded in the PES for this project. Our Regional office in San Francisco, California, will be available to provide input on this part of the final EIS. The final EIS needs to be clarified on two main points:

1. Historical land status and background on this route.
2. Physical, social and economic impacts on the inventoried roadless areas.

Page II-364 (Illustration 58), the Four Corners Region now covers all counties in the four States.

Page III-329, third paragraph states, "the Central Arizona Project is constantly striving to meet water demands of Phoenix area residents, and to date the project has been most successful." We believe the writer meant something other than the CAP.

Page IV-44, it is suggested that the wording be altered to either indicate that the project can be accomplished with no damage to Threatened and Endangered Species or a mitigation plan should be developed for any damage proposed.

Page IV-47 (#37), the discussion of water removal from natural stream courses during the construction phases should be more specific indicating removal amounts authorized and for what purposes.

Page IV-48, the stipulations listed were supplied as being representative of the type of conditions we have required in the past. As indicated in the statement they are not a complete listing, as others will be needed. Some will, no doubt, surface as a result of a detailed environmental analysis prior to issuance of an easement.

Page IV-59, it is suggested that stream protection zones be delineated where water and wildlife resource values exist and that no spoil disposal be permitted within these zones.

While the direct impact to forests in our California Region involves only 7.9 miles of transmission line, the one weakness we note in the draft EIS

is that it fails to note if the proposed route is the most feasible route. The alternate routes investigated should be assessed and the preferred route recommended. Assessments should be made of both the recommended route and the proposed route if they should differ.

A decision made on this project could directly affect several National Forests in Southern California.

The proposed 500 KV AC transmission line system could limit our management options on R/W locations currently being considered. Some of these projects include the Intermountain Power Project, Allen-Warner Project, Victorville-Rinaldi Project and the San Joaquin Nuclear Power Project. We realize that the energy intertie system in the Western U.S. is very complex. However, this is further complicated by the varied energy forecasting methods used by the utility companies as discussed in A-712-738 of the reference material. These varied forecasting techniques may tend to double-count the same people in Southern California. The key issue is that these projections call for an unacceptable number of additional transmission lines through the Angeles National Forest over the next 20 years. We need to be able to look at what is happening now so we can plan and manage the possible impacts in the future.

There should be a thorough discussion of the feasible alternatives. For example, in the discussion of alternate transmission systems, we note on pages 200-201 of Chapter VIII that one 600 KV DC line (which replaces 2-500 KV AC lines) has half the environmental impact and less visual impact. In addition, the report states that one 765 KV AC line (which replaces 2-500 KV AC lines) has half the environmental impact, but greater visual impact.

The draft statement presents a good picture of an extensive complex project. Please let us know if we can provide assistance in the analysis of the transmission lines through the roadless areas as mentioned in the foregoing.



FEDERAL ENERGY ADMINISTRATION

WASHINGTON, D.C. 20461

DEC 10 1975

OFFICE OF THE ASSISTANT ADMINISTRATOR

FEA 75-398

Mr. Paul L. Howard
State Director
Bureau of Land Management
Utah State Office
Department of the Interior
P.O. Box 11505
Salt Lake City, Utah 84111

Dear Mr. Howard:

This is in response to your letter of July 29, 1975, requesting comments on the draft environmental impact statement (EIS) for the Kaiparowits Project.

The draft EIS adequately describes the necessity for the Kaiparowits Project in terms of assuring adequate electric energy supply and in reducing our dependence upon imported oil and on natural gas which is in short supply.

Our comments below are presented to address certain energy and environmental concerns.

Cumulative Resource and Environmental Impacts

The draft EIS contains a significant amount of material describing the environmental impact of the Kaiparowits Plant. However, within a 200-mile radius of the proposed Kaiparowits site, there are other current or planned powerplants which will total approximately 17,500 megawatts (MW) of generating capacity. These proposed or existing coal-fired generating plants include:

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Power PlantMegawatts

Warner	500
Navajo	2,250
Hunington	860
Emery	830
Taney-Mountain Power Project	3,000
Garfield	2,000
San Juan	1,690
Allan	1,690
Cholla	965
Mohave	1,610
Four Corners	2,085

TOTAL

17,480

In addition to these plants, there are two proposed coal gasification projects, Burnham #1 and #2 and Wisco #1 and #2, as well as the proposed Alunite mining and processing project south of Milfort, Utah. It is important that, to the extent possible, cumulative impacts and interrelationships with other projects be discussed. This is necessary not only for assuring adequate consideration of environmental and resource factors, such as air quality and water usage, but also for assuring that further energy developments in the area can be accommodated. This general comment is expanded upon below. In addition, several other specific comments relating to the EIS are presented.

Water Usage

Figure 56 on page 354 of Chapter I presents the projected Colorado River water supply and depletions for Utah. Projected uses for irrigation, recreation, as well as Kaiparowits, Emery, and Hunington Canyon powerplants combine to leave approximately 166,000 acre feet of water available by 1990 out of Utah's total share of 1,322,000 acre feet. It is clear from the table that not much remaining water is available for other possible uses. Accordingly, will other projected powerplants, such as Garfield and the Inter-Mountain Power Project, also tap into the Colorado River for their water supply,

66-X-799

and if so, how will this be accomplished? In addition, given the scarcity of water and the competing uses for it in terms of energy development, can more beneficial uses of the water supply be defined? Although the EIS lists the competing uses for the water in terms of powerplants (coal-fired), oil shale, thermal electric generation, coal gasification, and tar sand development, it makes no attempt to consider how the water can best be used to supply the Nation's energy requirements. It is clear that at some point in the planning process, an overall assessment of planned water utilization should be made.

The draft EIS states that the withdrawal of 50,000 acre feet of water a year from Lake Powell for consumption use by the proposed plant would reduce Utah's remaining allocation of Colorado River water by about 3.8 percent. It is unclear how this percentage was derived. According to figure 56 on page I-354, the remaining water available to Utah was 497,000 acre feet. The use of 50,000 acre feet annually would therefore represent approximately 10 percent of the remaining water available to the State as of 1974. It is recommended that this be clarified in the final EIS.

Water Salinity

The question of increased salinity in the Lower Colorado River should be more fully addressed. On page III-6, it is estimated that approximately \$230,000 per year in damages to agricultural, municipal, and industrial users on the Lower Colorado River will occur for each milligram-per-liter of increase in the river salinity. Equating this in terms of the Kaiparowits proposal indicates a loss of \$489,000 per year, or a total of \$16,905,000 over the 35 years of the project. To the extent possible, a more complete picture of potential salinity problems should be presented including a discussion of possible energy requirements for desalinization plants if required.

Air Quality Impacts

There are two areas in which the discussion (Chapter 3, page 3-14 to 3-49) on air quality impacts in the area can be enhanced. These areas are:

1. The treatment of cumulative air quality impacts from Kaiparowits and other surrounding plants:

The EIS does not treat the combined effects of air quality impacts by Kaiparowits and the existing or firmly proposed powerplants in the area. Combined effects on visibility as well as the potential for additive impacts upon other air quality parameters should be considered more fully. It is stated in Chapter 2 of the EIS that air quality impacts from the Navajo Plant have been measured but are not yet available. Why are measurements taken in 1974 not now available for an analysis of the Kaiparowits project? Furthermore, in the absence of air quality measurements to determine cumulative impacts, cannot modeling techniques be used to predict the combined impact of these two plants?

2. The treatment of significant deterioration in the national park areas:

The EIS does not substantively discuss the potential implications of significant deterioration requirements on the Kaiparowits project. The decision stated on the errata sheet for Chapter 1 to discuss these implications only in the event that the national park areas are designed as Class I is inadequate.

It is possible that in the future the national park areas in the neighborhood of Kaiparowits could be designated as Class I areas. Therefore, the final EIS should contain a quantitative analysis of the implications for the Kaiparowits project if neighboring national parks are legislatively designed Class I.

Capacity Utilization

The FEA has recently reviewed updates of demand forecasts and resource plans for the Kaiparowits participants. Although the participants' current peak demand forecast for the year 1983, when the fourth Kaiparowits unit is scheduled for commercial operation, is 20 percent lower than the forecast presented in the Draft EIS, it is clear that the Kaiparowits Project will still provide the participants only a portion of their needed additional capacity. This is due to a planned requirement for an additional 8,600 megawatts by 1983 over 1975 capacity. However, as in any demand projection, inherent

uncertainties could eventually result in excess capacity. Therefore, to fully realize the benefits of the Kaiparowits Project, it is important that contingency plans be prepared to utilize the generating capacity to the greatest extent possible. The following measures should be considered in such a plan:

1. Since the capacity of oil-fired power generation will be still growing during the 1975-85 period, the participants should seriously consider utilizing any surplus electricity from Kaiparowits to displace some of the oil-fired capacity.
2. Since the peak demand period for both Arizona and Southern California will occur in the summer and the location of Kaiparowits plant is in Southern Utah where peak demand occurs in the winter, the interchange of the off-peak electricity generation capacity between Kaiparowits and Utah Power and Light Company should be considered.

Load Factors, Reserve Margins, and Energy Conservation Plans

The FEA seeks to encourage electric utility planning towards high load factors and low reserve margins to the extent that these are commensurate with adequate utility service requirements. Towards this end, the FEA has proposed certain numerical goals on an average overall national basis. The FEA recognizes the local nature of utility requirements and the variations in load factor and reserve margin that inevitably occur. However, these average overall goals are presented below and compared to the participants' figures in the hope that all possible measures will be considered by the utilities to achieve these goals to the greatest extent possible.

The planned load factors in certain applicant projections are low relative to FEA overall goals. By the same token, certain reserve margins appear unnecessarily high. In addition, we believe that certain energy conservation plans can be enhanced in some cases. These considerations are discussed below for each participant.

1. Arizona Public Service (APS) Projections¹

The load factors range between 52 percent and 59 percent for the period 1976-85. The target value set by FEA is 69 percent and the current national average is 62 percent. The reserve margins of 19.9 percent to 25.0 percent (for the period 1982-85) are high. Consequently, the capacity factor is estimated to be only 48.9 percent to 50 percent, which is less than the FEA's target value of 57 percent. Furthermore, no comprehensive energy conservation program has been planned.

2. San Diego Gas and Electric (SDG&E) Projections

Load factor values have been projected to be only 61.9 percent for the period after 1980. This value is low compared to FEA's target value of 69 percent. The energy conservation program described in Appendix B (of Appendix I-1) is a good plan. However, both load management and cost-based rate structures should be included in its plan.

3. Southern California Edison (SCE) Projections

SCE's forecasts on demand, growth rate, energy requirements and reserve margins all appear reasonable. The demand analysis and detail description and forecasting rationale in Appendix I-1 and III-9 are good. The energy conservation program described in Appendix B (of Appendix I-1) lacks consideration of potential load management and rate structure modifications.

¹Comments on the Salt River Project (SRP) Projections are not included since SRP is no longer a participant in the project.

We appreciate the opportunity to comment upon this important project and hope that our comments will be useful to you.

Sincerely,



Roger W. Sant
Assistant Administrator
Energy Conservation and Environment

Exhibit C

Comment letters received after closing date of public response period
(after January 1, 1976).

OFFICE OF THE SECRETARY
RESOURCES BUILDING
1418 RINTH STREET
SUNITE
(818) 445-5856

Department of Conservation
Department of Fish and Game
Department of Recreation and
Drama Development
Department of Parks and Recreation
Department of Water Resources

EDMUND G. BROWN, JR.
GOVERNOR OF
CALIFORNIA



Air Resources Board
Colorado River Board
San Francisco Bay Conservation and
Development Commission
Solid Waste Management Board
State Lands Commission
State Reclamation Board
State Water Resources Control Board
Regional Water Quality Control Boards
Toxic Resources Conservation and
Development Commission

THE RESOURCES AGENCY OF CALIFORNIA

SACRAMENTO, CALIFORNIA

DEC 22 1975

Mr. Paul L. Howard, State Director
Bureau of Land Management
U. S. Department of the Interior
Washington, D. C. 20240

Dear Mr. Howard:

The State of California has reviewed the Draft Environmental Impact Statement, for the proposed Kaiparowits Project, Volumes 1-5, submitted to the Office of Planning and Research (State Clearinghouse) in the Governor's Office by the Bureau of Land Management, U. S. Department of the Interior. This is in accordance with Part II of the U. S. Office of Management and Budget Circular A-95 and the National Environmental Policy Act of 1969. This review was coordinated with the Departments of Water Resources, Food and Agriculture, Transportation, Health, Conservation, Fish and Game, Navigation and Ocean Development, and Parks and Recreation; the State Water Resources Control Board; the Reclamation Board; the Air Resources Board; and the Colorado River Board of California.

The State's specific comments which are contained in Attachment No. 1 are to be considered as an integral part of this letter. The general comments are as follows:

Electrical Need Analysis

The Kaiparowits Project is considered as a planned resource to be added by Southern California Edison and San Diego Gas and Electric Companies in the California Public Utilities Commission staff's "Report on 10-Year Forecasts of Electric Utilities' Loads and Resources" dated May 19, 1975. This report indicates that the 1900 megawatts to be added in 1981-1983 by these Southern California utilities is needed.

Mr. Paul L. Howard, State Director
Bureau of Land Management
Page 2

Chapter I (Need for Proposed Action) contains no independent forecasts of electric load growth by either the staff of the Department of the Interior, the Federal Energy Administration, or any public agency. Instead, the utilities' forecasts were accepted as the best available for their particular service areas. In fact, the utilities themselves have made later load forecasts than those accepted in the Draft EIS and the Public Utilities Commission staff has made forecasts of electric load growth for Southern California Edison Company (Edison) and San Diego Gas & Electric Company (SDG&E). The utility forecasts are contained in their General Order 131 Reports filed with the Commission in 1975, and the staff forecast is contained in the report cited in the previous paragraph. The EIS should contain a conclusion on the year the proposed project is needed to meet system peak demands. Edison and SDG&E's shares of the project are now estimated to cost \$2 billion, which could have a significant impact on electric rates in Edison's and SDG&E's service areas if the plant is built before it is needed.

The State is concerned that if demand forecasts overestimate the actual electrical need and a surplus of electrical energy is available, growth will be encouraged to fulfill the demand forecasts and the proposed conservation efforts will be curtailed. Conservation measures raise energy productivity and efficiency thereby lowering waste and pollution. Page A-723 of the EIS states the following:

"... all demand projections affect the actual energy demand. That is, if utilities underestimate projected demand and only provide the amount of electricity estimated, actual demand will obviously be curtailed so that it matches that predicted. Conversely, if demand is overestimated and increased electricity is available for consumption, utilities may curtail conservation efforts and thereby stimulate demand to the anticipated levels. In a very real sense, demand forecasts are important determinants of actual consumption rather than the other way around. As the Federal Energy Administration has stated, because demand forecasts tend to be self-fulfilling 'it is not possible to verify adequately the validity of critical assumptions upon which projects are based'."

As stated earlier, no independent predictions of future electrical demand of the market area were made. Figures 11 and 17, which illustrate San Diego Gas and Electric Company (SDG&E) and Southern California Edison Company (Edison) projected per capita energy consumption forecasts, need further clarification. The figures illustrate that SDG&E per capita consumption rate nearly doubles,

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IX-805

5,000 to 9,500 KWhr/capita between 1974 and 1985. Likewise, the Edison per capita consumption rate increases from 7,800 to 11,500 KWhr/capita from 1977 to 1985. This increase seems out of line with the implementation of the proposed conservation measures outlined elsewhere in the EIS. It is unclear why these consumption rates, which supposedly incorporated conservation measures, are projected to increase so drastically during this time period. It would seem logical that implementation of energy conservation measures would eventually decrease per capita consumption levels. Overestimated energy demand forecasts would have a serious detrimental effect on air quality. Surplus energy would stimulate population growth in an area that currently is unable to achieve adequate air quality.

Air Quality

The direct air quality impact of the proposed project would be felt primarily in the State of Utah. Approximately 12.2 tons of particulate matter (PM), 34.3 tons of sulfur dioxide (SO₂), and 250 tons of oxides of nitrogen (NO_x) would daily pass through air pollution control equipment and be emitted into the atmosphere. The air quality impact on California, although indirect, would be significant and needs to be recognized by the project proponents.

Transmission Line Corridors

The environmental impact statement does not adequately address itself to the cumulative impact of the project transmission line corridors as they affect lands within the State of California. A coordinated approach toward siting the corridors that will handle the increased quantity of transmission lines is necessary.

Alternative Route

The State finds the Ward Valley alternative route to be the least damaging. Construction along this route would avoid significant adverse impact on the desert bighorn populations within the Coxcomb Mountains and on springs important to a wide variety of wildlife species within the Indian Hills. In addition, this route would avoid adverse impact on the Coachella Valley fringe-toed lizard.

Wildlife Mitigation Measures

The section discussing mitigation measures to offset project impact to fish and wildlife resources is inadequate in that it fails to discuss mitigation for the loss of approximately 7,500 acres of wildlife habitat attributable to power line construction.

We believe that mitigative actions should be discussed in the EIS. More detail discussion regarding this concern is included in paragraph 3 (Fish and Wildlife) in Attachment No. 1 to this letter.

Recommendations


The State recommends that the final environmental impact statement (EIS) respond to the concerns and include the views as set forth in these comments. Because of the concerns expressed in this letter, we will defer expression of our final views on all issues until such time as the final environmental impact statement is filed under the provision of the National Environmental Policy Act of 1969, and the concerns expressed herein are fully explored. We hope that more data will be available in the final statement on which to base our final position on this and related matters.

The State also reserves the right to comment on the basic question of need when the final EIS is evaluated.

Thank you for the opportunity to review and comment on this project.

Sincerely,

CLAIRE T. DEDRICK
Secretary for Resources

By 

Attachment

cc: Director of Management Systems
State Clearinghouse
Office of Planning and Research
1400 Tenth Street
Sacramento, California 95814
(SCH No. 75080476)

SPECIFIC COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR PROPOSED KAIAPAROWITS PROJECT, VOLUMES 1-5

These comments are an integral part of the State's comments.

1. Salinity Control in the Colorado River

The proposed removal of 50,000 acre-feet of Colorado River water and the concomitant salinity increase will in concert with other projects proposed for development in the Colorado River Basin, increase the importance of support and implementation of the extensive salinity control measures being initiated throughout the basin by the seven western states.

Zero salt return is consistent with the thrust of the August 1975 report by the seven-state Colorado River Basin Salinity Control Forum on Colorado River Salinity Standards. The statement should outline the program for insuring that salt from the concentrated blowdown from the power plant is safely contained during the operation of the plant, and in the future if the plant operation is terminated. It is important that the salt not be allowed to return to the water supply to become a future problem to downstream water users.

2. Erosion Control

An aspect of erosion control not specifically mentioned is that transmission towers should not be located within washes or other areas subject to periodic, if infrequent, flooding. Both the presence of the tower in the flow of water and the disturbance of the soil during construction would increase erosion of the wash and sediment transport to the water body or land areas receiving the water. Engineering criteria to be applied during design and construction for the elimination of such effects should be described.

3. Fish and Wildlife

Chapter III, Page 171 - This section should include a discussion of potential electrocution of raptors by project transmission lines and towers. It is unclear as to whether the transmission lines and towers will be designed to minimize such impact.

Chapter V, Page 38 - We disagree with statements in this section that an increase in legal hunting, which may occur as a result of improved access attributable to this project, would be detrimental to game populations.

In connection with loss of wildlife habitat attributable to power line construction, the following mitigative actions should be discussed:

1. Compensation for habitat loss along the power line route by improvement of wildlife habitat on adjacent lands, thereby increasing its wildlife carrying capacity.
2. Development and maintenance of wildlife watering sources along the power line route.
3. Acquisition of private lands having similar habitat values and placing them in public ownership, thereby protecting their wildlife resources value in perpetuity.
4. Route Alignment Facts for Proposed Mojave-Devers Segment

The listings of road crossings in Chapter I on pages 221 and 225 should be corrected to read as follows:

<u>Figure 35, page 221 -- Road Crossings</u>	<u>No.</u>
Interstate 40	1
U. S. Route 95	1
State Route 62 (Calif)	1
State Route 177 (Calif)	1

The Mojave-Devers segment does not intersect State Highway Route 111.

<u>Figure 36, page 225 -- Road Crossings</u>	<u>No.</u>
Interstate 10	1
Interstate 15	1
State Route 74 (Calif)	2
State Route 79 (Calif)	1
State Route 111 (Calif)	1
State Route 194 (Calif)	1
State Route 243 (Calif)	1

California does not have a State Highway Route 293; therefore, we assume that the listing on the above-mentioned page is a typographical error.

An encroachment permit is required by the California Department of Transportation prior to performing any work within the state highway right of way. This includes access roads and any temporary structures used for the protection of motorists during the stringing of conductors over the highway. Placing the conductors is construed as doing work within the right of way. These encroachment permits are to be obtained from the highway district having jurisdiction of the highway route involved.

The majority of the road crossings in California are under the jurisdiction of District 08 of the Department of Transportation in San Bernardino.

Route 177 (Calif) is under the jurisdiction of District 11 in San Diego. It has been agreed by District 11 that the comments made by District 08 shall apply to State Highway Route 177 in Riverside County.

5. Power Considerations

Chapter I. Economic effects of the proposed project should be discussed in the report.

Chapter I, pages I-28 and I-35. The report should include an evaluation by Southern California Edison or San Diego Gas and Electric Company of the effect that peak load pricing, revision in rate schedules, or conservation measures would have on the graphs of the Project Per Capita Energy Consumption.

Chapter III. Methods or studies to substantiate the reduction of NO_x to an acceptable level should be discussed. It should be stated whether the NO_x requirement would be exceeded if the site is redesignated as a Class I area.

Page III-2. The report should indicate if the SO₂ requirements would be exceeded for the 3-hour and 24-hour maximums as predicted by the three-dimensional numerical model study.

Page IV-8. Studies made by Bechtel Corporation and Radian Corporation on systems for SO₂ abatement and reduction of plume opacity should be included in the report to permit reviewers to decide whether the emission requirements are being met.

Chapter V. The project's adverse effects on human health should be included in the report, especially with regard to the proposed new town.

Chapter VI. The long-term risks to human health from coal mining operations or the release of sulfates, nitrates, phosphorous, and trace elements should be assessed.

Chapter VIII. The "no project" alternative and its impact should be considered.

Chapter VIII. The environmental statement does not address the alternative of obtaining coal from other locations in Utah. Any studies by the project participants which would result in locating the coal mine and the power plant farther away from national parks and historical land marks should be fully discussed.

Chapter VIII. The proposed project will obtain water from Lake Powell for power plant use and for coal mining operations. However, the environmental statement has not adequately considered water conservation measures that will enable water from Lake Powell to be used for other purposes. Conservation measures such as the use of waste water for project use should be considered and fully discussed.

Chapter VIII-7. The alternative of locating the proposed project outside the State of Utah has not been adequately discussed. Since California is expected to receive about two-thirds of the electrical output of the proposed project, an alternative of locating the project in California and transporting the coal by rail or pipeline is an obvious alternative and should be considered. An alternative of locating the project in the southeastern desert area in California would decrease the environmental impact of the long transmission lines to both California and Arizona.

Chapter VIII-8. Discussing alternative means of meeting project objectives is very weak. Only brief statements are made dismissing the alternatives; there is no discussion of the environmental impacts of the alternatives. A thorough evaluation of the need and alternatives would show that a mix of generating resources is required for a properly balanced system - nuclear, coal, oil and gas, hydroelectric and other resources combined with a vigorous program of energy conservation. The discussion of energy conservation on page VIII-8 and 9 appears to be inadequate. We have observed short-term results of conservation programs in California, so conservation is not merely a long-term change in consumption patterns as stated.

Chapter VIII-350. The listing of California utilities' participation in nuclear projects should also include other proposed projects such as San Joaquin and San Desert Nuclear Projects.



UNITED STATES
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION
WASHINGTON, D.C. 20545

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Mr. Paul L. Howard

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JAN 14 1976

Mr. Paul L. Howard
Utah State Director
Bureau of Land Management
U.S. Department of the Interior
127 South State Street
Salt Lake City, Utah 84111

Dear Mr. Howard:

This is in response to your transmittal dated July 29, 1975, inviting the Energy Research and Development Administration (ERDA) to review and comment on the draft environmental statement prepared by the Bureau of Land Management to support the Department's required action to allow for the Kaiparowits project to be completed.

We are somewhat concerned that the ecological aspects, as presented in the statement for the proposed project, appear to be covered only broadly, with little in-depth treatment of the many problems. The format is well organized; however, the environmental sections are sketchy and somewhat vague. There are little data on and few references to studies, which, in our opinion, should be there to provide backup information for the statements that are made. For example, the vegetation description in chapter II is vague and general, and is of little help in analyzing what the impacts of the proposed project on this system might be. A preferred treatment would be to provide a quantitative description of the structure (population density, species diversity, etc.) and function of the biota existing on the site prior to development by the utility. A good data base is necessary so that the actual impact of the plant can be accurately assessed in the future.

The Kaiparowits project has a large potential for impacting, with possible destruction, on the wildlife on the 6000-acre site. For example, on page II-4 it is indicated that over ten species on the Federal rare and endangered species list are in the area of potential plant and operations impact. Elsewhere (page II-7) we are told that over approximately 6,000 acres of wildlife habitat would be "permanently eliminated." One-third of the endangered species found in the area are fish. In chapter III (page III-8) it is stated that necessary releases from the proposed Kaiparowits plant could

endanger the sport fisheries of Lake Powell. Data should be presented that would permit evaluation of the impact of various levels of mercury contamination on the endangered species. In this regard, we were especially concerned that the Office of Endangered Species apparently did not know about the issuance of this statement until we called it to their attention during our review.

While it is apparent that some field work has been done on the biological aspects of the study, it is equally apparent that much of the input in the statement is clearly by literature citation. We suggest that the references in volumes II and III to the occurrence of endangered species in the impact region should be supported with some additional field studies before any conclusions reached regarding the proposed action are implemented.

The draft does not provide sufficient information to enable one to evaluate the assessment of air quality. The evaluation of potential pollution concentration in air is based on some field work plus a computer model of expected dispersion in the more severe cases. We would like to see an explanation of experimental procedures in sufficient detail to ascertain if the spacing of air samples was adequate to define the plume. No details are given of the numerical model used, estimates of error, or whether the model was conservative. In our opinion, the long-range transport of effluents and effects, such as acid rain, should be treated in the final statement.

We are also concerned that the statement does not address or consider the cumulative air quality impacts, since this 3,000-Mwe Kaiparowits coal-fired power plant is only part of the nearly 21,000 Mwe of coal-fired power plants within a 200-mile radius planned to be in operation by 1985. When the proposed gasification plants are added, the potential for cumulative air quality impacts obviously exists. Even though pollution equipment may operate at design levels, 34 tons of sulfur dioxide, 12 tons of particulates, and 250 tons of nitrogen oxides will be emitted per day; therefore, the cumulative impacts on the air quality, with the existing 20 percent capacity limitations, must be considered and addressed properly in the final statement.

Additionally, the Kaiparowits project should be considered as part of the total coal-development program on Federal land in the Southwest. The analysis should include effects of urbanization and secondary impacts, including the effect of the proposed plant on the aesthetic and recreational value of the national parkland. For example, how visible will the plant, lights, and plume be from Bryce Canyon? Also, one may question the expenditure of energy and money for emission control if it will be likely that scrubber waste and fly ash may erode into Lake Powell after the plant is abandoned at the end of its 35-year projected plant life.

157-809



ERDA COMMENTS ON THE
U.S. DEPARTMENT OF THE INTERIOR
DRAFT ENVIRONMENTAL STATEMENT
KAIPAROWITS PROJECT

General Comments

Socioeconomics:

- (1) In several places, the loss of both known and unknown places of paleontological and archaeological values was noted (chapter 2, pp 5-7, 241-285; chapter 3, pp 9, 185-200; chapter 4, pp 3, 28-30, 45, 84; chapter 5, pp 7, 49-51; chapter 6, pp 15). It was admitted that permanent adverse impacts would result (chapter 5, pp 7, 49-51). Comments about these ancient remains in the section on measures to mitigate impact raise questions about the response of the project developers. At both state and Federal levels, statutes exist that call for the discovery and preservation of all sites before they are ruined by development. (For specific provisions, see chapter 4, pp 50-52, 72-73, 74-76, 84.) One of the questions that needs to be answered by the companies is to what extent they are going to take action to prevent destruction of these unique and valuable resources that are plentiful in the areas they intend to disturb by their construction.
- (2) In the discussion of the population in towns surrounding the plant and mine sites, certain impacts are described but there is no indication of plans to mitigate the impacts they will experience even if the new town absorbs much of the new population. One reason for this is the small number of people involved (chapter 2, pp 9). (The population most likely to be affected by the development was calculated to be 3,229 in 1970.) The statements made about this area indicate that the way of life will be permanently changed (chapter 7, pp 6). Grazing and forage land will be lost to development (chapter 3, pp 233; chapter 5, pp 8), the out-migration may stop (chapter 2, pp 9). In the case of Boulder, Utah, and other towns, this is expected to be a loss in terms of particular beauty as well as of a nonindustrial way of life. A public opinion poll was made in this area for use in the preparation of the statement (appendix II-25, volume 5). No copy of the complete survey instrument was included, although questions mentioned in the text dealt with attitudes toward population growth, economic development, and housing. The absence of an explanation of the size of the universe being studied and the means by which a sample was selected makes the conclusions impossible to interpret. This should be rectified in the final statement.

Mr. Paul L. Howard

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The information provided in the statement concerning the rejection of nuclear reactors as an energy source is not substantiated. The principal treatment afforded this technology (pages VIII-350 through VIII-352) contains little actual discussion regarding the environmental impacts and risks of the nuclear power alternatives. This section, as presented, does not give factual information regarding the nuclear power alternative which could be used in the decisionmaking process and we suggest that the treatment of nuclear power be expanded. The Department and the Bureau are in possession of several documents previously provided by the former Atomic Energy Commission and ERDA which would be helpful in updating and expanding this alternative.

Additional staff discussions and comments relating to specific areas of the statement are enclosed for your consideration in the preparation of the final statement.

In summary, we are deeply concerned about the total impact--immediate, cumulative, and future--of the proposed project, which has the "potential of deferring use of 80,000 barrels of oil per day" to "allow the utilities to maintain what they consider to be acceptable reserve margins." If this report is to be useful in determining the impact of the utility, a great deal of additional quantitative information needs to be supplied. Perhaps a wiser approach would be to select those aspects of the specific site and facility which are considered to be most representative, critical, and unique for extensive in-depth coverage, rather than to attempt a superficial treatment of all possible environmental issues.

Thank you for the opportunity to provide these comments.

Sincerely,

James L. Liverman
James L. Liverman
Assistant Administrator
for Environment and Safety

Enclosure:
ERDA Staff Comments

cc w/enclosure:
CEQ (5)

Ecology and Reclamation

- (1) It was stated on page I-53 that there would be no increase in storm run-off, since run-off would be diverted into natural drainages. The main problem with the use of culverts and diversion ditches is that, due to their shape, they tend to increase the velocity of the run-off. The increased velocity would also increase sedimentation. Depending upon the length of the diversion channels and the number used, this could be a significant impact. The increased sedimentation should be included in the later calculations under "Environmental Impacts."
- (2) The design of the wood power pole, page I-92, illustration 19, should be checked with regard to electrocution of large birds such as eagles. We suggest referring to "Suggested Practices for Raptor Protection on Powerlines," a report prepared in the public interest, distributed by Raptor Research Foundation, Inc., for Edison Electric Institute.
- (3) Reclamation of the fly ash scrubber disposal site may be more of a problem than has been anticipated. By "cementing" the top layer, two problems are created. The top layer of fly ash scrubber material could act like a hardpan, restricting root growth and creating unfavorable moisture conditions by restricting infiltration. Evaporation from the one-foot thick topsoil would be high, and most incoming moisture would be lost to evaporation. The second problem associated with the fly ash scrubber surface is the interface between the topsoil and the waste material. Reclamation research has shown that the interface between the compacted spoil and topsoil is difficult for roots to penetrate. More often, roots will travel horizontally along the interface, making the plants more susceptible to drought. There should be measures in the participants' proposal that will mitigate these unfavorable effects (e.g., discing). The topsoil itself may cause problems. If it is not sufficiently compacted, plants will not become firmly rooted enough to be grazed.
- (4) Plant productivity (page II-159) is described as low in the piñon-juniper woodland of Fourmile Bench, yet the value given (<100 lb/acre/yr) is for understory vegetation. No values are given for the overstory.
- (5) On page II-60, it is stated that in the canyons, plants are "more dense" and species diversity is "greater" than on the benches. With no absolute or even relative values given,

these statements are of little value. What is "comparatively low" vegetation productivity? More important yet, how can one compare productivity or diversity at the site five years from now with these statements?

- (6) What is meant by the statement that the vegetation of the site is in a "stable-to-slightly-improving trend?" (page II-161)
- (7) Of what possible value is a list of rare and endangered species which may occur in the area? (page II-173) Do they occur there; what is the population size; is the last remaining habitat of the species in this area; what is the size of the population elsewhere? This type of vague listing of species provides no concrete information and merely prompts a number of other questions.
- (8) The boundaries of the vegetation types are not clearly delineated on the figure (page II-178).
- (9) The descriptions of vegetation types along the transmission line (pages II-161-179) are extremely brief and merely skim the surface. Again, no quantitative values are given.
- (10) The use of AUM's (animal unit months per year of livestock/wildlife forage) is vague and not well defined (pages III-139-147). Is this based on a standard livestock or wildlife species? Why not express this in a standard and more widely understood form, such as calories/yr? The number of animals of various species which could be supported could then be indicated.
- (11) These sections on environmental impacts and unavoidable adverse effects (pages III-135 and V-31) are very general and seem to represent only crude guesses. A more complete data base regarding preconstruction conditions would facilitate these predictions.

The wildlife sections of the report provide no better descriptions of existing species populations than do the vegetation sections. The following two examples indicate this:

- (a) No estimates of population size or density are given for big game species inhabiting the area (page II-180).
- (b) On page II-186, the small mammal populations are described in vague terms such as "great diversity of species," "relatively dense concentrations," "no population trends... known to exist." What do these mean, specifically?

- (12) Chapter III discusses high concentration areas of raptors. The idea of high concentrations areas are unrealistic and would, thus, be demonstrated through field work. In both volumes II and III, the idea that endangered or threatened species occur widely through the impact region is thrown around with abandon. While it is true that many of the bird species mentioned are sensitive and at least two are endangered, none from any of the categories occur to any degree, if at all, within the area of concern. Field studies would again help clarify this point.
- (13) Although the status of some of the species is quantified as to breeder or simply having a presence-absence status, a more refined breakdown of this sort is in order. The simple presence of a bird within a region may not be meaningful in fulfilling the design or needs of the impact statement. The species lists especially suffer from the lack of field work, e.g., the addition of Ross Goose to the list is certainly of rare occurrence to the region and then only to the region in general and not the area of impact.
- (14) There should be more discussion of the salt run-off from the affected area. On page III-4 it is stated that about 5% of salts would be lost each year to run-off. From the 250 pounds per year sites, that amounts to approximately 12 pounds per year run-off.
- (15) The proposed plant site is in the area where the vegetation communities are the most sensitive to salt. Since the salt accumulation will be the greatest in the immediate area surrounding the plant, and if the accumulation prediction is accurate, the pinyon-juniper and big sagebrush communities will no longer exist after 12 years of plant operation. The salt-tolerant communities are less palatable, resulting in the loss of another 1,300 acres of rangeland. The question arises: Is there an area for the power facility that is inhabited by salt-tolerant communities where salt accumulation would have less of an impact?
- (16) The statement (page III-78) gives the impression that it would be useless to establish vegetation on the ash and scrubber dump due to the erodibility of the 4-to-1 slopes, the shallow arid soil mantle, and the salt accumulation. The ash-scrubber area should not consist of 4-to-1 slopes

- entirely; erosion prevention would be nearly impossible. It is questionable that there should be any 4-to-1 slopes. The shallow arid soil mantle could be stabilized by mechanical or chemical means during vegetation establishment. If salt-tolerant species are used in the revegetation effort, the salt accumulation will not be as much of a problem.
- (17) The statement (page III-81) claims that there will be no increase in run-off and erosion, since the aggregate pit is located in the creek bed. It would seem that the disturbance alone would increase sedimentation that would increase erosion. Since there is no indication of the depth of the pits, there can be no prediction as to how soon the "traces" of the aggregate pits would disappear.
- (18) The supposed improvement in Lake Powell salinity (page III-117) due to municipal water use is doubtful. Municipal use will increase the salinity of the water and if salts are not to accumulate in the irrigated fields they must be leached into the ground water or carried off in drains.
- (19) There should be a statement (page IV-10) as to how the participants expect to reduce the fugitive dust.
- (20) Detailed monitoring plans (page IV-12) need to be submitted. There are several placed throughout the report, particularly in connection with erosion and sedimentation, where the impact figures are theoretical. These need to be monitored during and after construction so that any increased impacts can be mitigated.
- (21) The discussion of the impacts of the limestone quarry is incomplete due to the absence of a mining and reclamation plan. There is a general plan, but nothing specific enough for a discussion of impacts. The statement is made on page III-151 that there are "some portions" of the site that will not be revegetated. How much and where are the "some portions"? Areas that are not revegetated will increase sediment loads and jeopardize adjacent vegetation. The statement is made that "it is not known if the site would have a comparable vegetative productiveness after mining." The absence of a detailed reclamation plan implies that no research has been done into the matter. The statement combined with the "some portions...would not be revegetated" leaves the impression that there could be little or no revegetation effort on the site.

- (22) The single *Pinus longaeve* stand appears to be partly in the quarry. Although it is not listed as an endangered species, its range is restricted to the Intermountain area. Since it is a slow growing species and its reestablishment is uncertain, it is questionable that the quarry should disturb this stand.
- (23) The statement is made that although there are species present of restricted or narrow range, the fact that none are endemic to the limestone quarry site allows their removal (page II-177). There is not, however, a list of these species in the text. (Incidentally, appendix II-8 does not list the quarry dominant species. That list is located on page II-179.) Furthermore, the removal of one population of a restricted species raises the probability of extinction (of the species) through accident or natural causes simply due to the fact that fewer populations remain.
- (24) There are no detailed reclamation plans available for any of the disturbed sites, including the mine. Nowhere does it state that native vegetation will be used. Irrigation should definitely be considered as a requirement. Previous reclamation studies have indicated that it is a viable option. The statement that grubbed vegetation will be used (I-53) needs to be explained. Methods of seeding and management need to be explained. The reclamation facet of the impact statement is incomplete.
- (25) The presence of access roads is probably the greatest impact of the entire proposal. There will be at least twice as many people in the area and disturbance of the biota will be severe. The access roads should not be open to the public. The alternate route from Kaiparowits to Eldorado and the Arizona Strip route should not be considered. The Navajo-to-McCullough line is already in existence and disturbs part of the raptor, most of the desert tortoise, and some of the desert bighorn habitat. The alternate routes would disturb more of the raptor and bighorn sheep habitats.
- (26) Care should also be taken to avoid the unique plant communities on the transmission routes. Overland vehicles that would be present even with restricted access would probably destroy these.

Air Quality Consideration

- (1) The atmospheric dispersion models used in the present study for the Kaiparowits power plant appear to be well selected state-of-the-art models. It appears that they have been applied judiciously to the cases under consideration. However, none of these models can really properly take into consideration the complex terrain effects that are important in the Kaiparowits region. The field studies that should reveal much about the terrain effects were carried out only for restricted meteorological conditions that do not cover the important cases of inversion breakup fumigation and trapping conditions. Therefore, it is extremely important to have field data for the important cases and to apply the dispersion models to the situations for which there are field data. The credibility of the model application and the conclusions about air quality is questionable without such analyses.

- (2) The assessment of potential concentrations of air pollutants was based upon:

- a. some field work in basically neutral conditions.
- b. some computer model of expected dispersion in the more severe cases that might be expected.

This is not an unreasonable procedure but the experiments are not described sufficiently to know if the sample spacings were adequate to define the plume and whether they could have missed the peaks. Neither are any details given of the numerical model used. Several models were compared and the one chosen because it agreed best with the field trials. No estimate was given of the errors, ideas of whether the model used was the most conservative, or even its output parameters. The model is supposedly described in a report to Southern California Edison, but we have no idea of what it is like. Without some better description of the experiments and the model, we have no way of validating the estimates.

- (3) The long-range transport of the effluent is not considered and whether it is likely to impact downwind in, say, acid rain or sulfate deposition. These aspects should be treated.
- (4) What is the source of the 20% opacity limitation mentioned on pages III-3 and III-37?

Environmental Control Technology

Attention is focused on the control strategy suggested in those sections of the statement for atmospheric pollutants (from pages I-48 to I-78, I-113 to I-115 in chapter I, and from pages II-22 to II-54 in chapter II). This evaluation is to assess the adequacy of the descriptions of emission control equipment and the validity of the claims made for the performance of the control equipment.

- (1) With regard to techniques for reducing emissions of SO_2 , NO_x , and particulates, the statement suggests that these pollutants are treated separately and independently by the control systems. While designed to remove one specific constituent, a control device may reduce or perhaps increase, the emissions of other pollutants as well. A typical example is provided by the wet scrubber on the Four Corners power plant in Arizona. Although the scrubber was originally designed for fly ash removal, test results confirmed that the unit also effectively removes 30-35% of the SO_2 present. (See Environmental Science and Technology, 8(516), 1974). The statement should describe the expected overall effectiveness for removal of these pollutants by the total stack gas cleaning system.
- (2) The lack of technical verification on the performance of the control equipment makes it difficult to judge the accuracy of the anticipated pollutant removal efficiencies of 90% for SO_2 , 30.7% for NO_2 , and 99.5% for particulates from the flue gases. The statement should contain some discussion establishing the grounds for the estimated emission levels and giving the reasons for choosing the proposed control systems over alternative methods.
- (3) There are reasons to believe that the over 30% reduction of NO_2 cannot be achieved by the design of boiler alone. Furthermore, there are no full-scale performance data on the effectiveness of coal-fired burner modifications for NO_2 control to support the statement that a 30% removal efficiency is possible. Although experimental burners with higher percent reductions than the committed level for NO_2 have been reported, these methods seem not to have been developed to the point of demonstrated commercial feasibility. The same applies to the claim that the wet-line scrubber can achieve 90% SO_2 removal. It would be helpful to the evaluation of these statements to have information on the design specifications of the emission control equipment and summaries of test data on their performance.
- (4) One of the frequent problems associated with many emission control methods is that during the process of controlling one

pollutant, others are generated. In the case of steam boilers, by limiting the amount of air entering the burner as an effective means of controlling NO_x production, there may be an increase in the concentration of CO and hydrocarbons in the flue gas owing to incomplete combustion. This complicates the operation of the boiler if control efforts are directed at reducing simultaneously all three of these contaminants. Thus, information on the expected CO and hydrocarbon emissions from the boiler should be included, and the design criteria, if any, that were used in balancing the tradeoff between NO_x emissions and CO/hydrocarbon emissions should be given.

- (5) The statement should describe the corrective action to be taken if the emission limits are exceeded because of the malfunction or poor performance of the control equipment.
- (6) Discussion of the effects of the plant on air quality are based on the design efficiency of the control equipment. It would be better to base the assessment on an estimate of the operating efficiency.

Alternatives

This section appears difficult for a decisionmaker to use, because a clear evaluation ("cost-benefit analysis") within each group of alternatives is not provided. Also, economic costs are not consistently treated although NEPA implicitly requires their consideration.

- (1) Nuclear Power
 - a. No substantive information is provided in the statement to support the rejection of nuclear reactors as the energy source. The principal treatment of this subject is found on pages VIII-350 through 352. This section starts with a recitation of the nuclear involvement of the project participants, and ends with a number of paragraphs of generalized (and somewhat misleading) information on nuclear power environmental impacts and risks. Little of this is pertinent. The one paragraph which does pertain (page VIII-351) is:

"Decision to construct coal over nuclear depends upon evaluation of various economic, technical and environmental factors and the time at which evaluation is made. In this case, the choice was directed by availability of coal, participating utilities' policies to

reach what they consider a proper balance between nuclear and fossil fuels, and their uncertainties in scheduling nuclear generating stations. However, nuclear power plants are a definite alternative to coal-fired plants."

One should not have to guess what is meant by "...a proper balance...", and "...uncertainties in scheduling...". Further, a summary comparison of environmental impacts and dollar costs (capital and operating) for the coal-fired and nuclear options, at the selected site or, if appropriate, at alternate sites should be provided. As written, this section does not present factual information which can be used in the decision process.

- b. The treatment of wet/dry and dry cooling towers as alternatives to wet cooling towers (pages VIII-47 through VIII-50) is not adequate, as shown in the following:

1. Wet/dry towers do not cost 6 times as much as wet towers (page VIII-48, last paragraph).

Recent estimates are:

Type	Capital Cost	Total Evaluated Cost
Wet	\$21.5M	\$34.1M
Wet/dry	\$40.1M	\$78.4M

The total evaluated cost includes the sum of capital cost, capacity penalty (due to higher turbine back pressure), energy replacement penalty (due to turbine back pressure variations), capitalized annual cost for operating cooling water pumps, capitalized annual cost for operating the terminal heat sink, capitalized annual cost for make-up and water treatment, and capitalized annual operating and maintenance cost.

2. The dry cooling tower heat rate penalty on an annual basis is typically 3% or less (compared to wet cooling towers), rather than the 4 to 10% range given on page VIII-49, third paragraph.

3. It is not generally thought that there is an increased noise problem with dry cooling towers (page VIII-50, third paragraph). A hyperbolic natural draft wet cooling tower is likely to produce more noise than a similar dry cooling tower due to water distribution system (packing, fill, splash bars, etc.)

4. Inadequate information and/or references are provided regarding potential environmental impacts. For example, the approach used to calculate salt drift and deposition was not apparent, either in the text (chapter III) or in the appendices (appendix III-6). It was only stated that various models (MRI, 1974; Hanna, 1974, etc.) were used. The references were too sparse to be of value. As a minimum, a more complete set of references should be provided.

- c. On the Summary Sheet (chapter I) and page IX-9, the Atomic Energy Commission should be changed to the Energy Research and Development Administration.

- d. The last paragraph on page I-322 is erroneous and should be deleted.

- e. Curves for the 1 and 2 hour duration storms on figure 1, page A-617 are not labeled properly.

- f. In the 6th line from the bottom on page A-637, "\$" should be deleted.

(2) Conservation

- a. The treatment is largely a formless collection of diverse remarks;
- b. None of the possible approaches to increased conservation is treated quantitatively (e.g., the effect of a 10% increase in efficiency of use for new residences could be discussed);
- c. The two concluding paragraphs (page 361) contain several unsupported and not particularly plausible statements.

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- d. The projections of the Energy Policy Project for various scenarios are accepted uncritically and without discussion.

(3) Delay or Denial

This section is very weak relative to the importance of the questions addressed. The major choices, which are the subject of the entire statement, are: 1) build a power plant at Kaiparowits, 2) build one somewhere else, or 3) do not build one at all. Other weaknesses are:

- a. The possible effect of kwh shortages in the utility market areas is scarcely treated at all;
- b. The environmental effects of alternative plans in comparison to the proposed plant are not considered.

(4) Alternative Routes

A good case seems to be made in the chart on page VIII-103 and the text for the Flat Top alternative for the Kaiparowits to Eldorado route. The avoidance of the highly scenic Cockscomb area is particularly significant and could easily compensate for the 9 additional miles. The Black Hills alternate is shorter than the proposed route, the chart indicates no increased impacts, and the text indicates reduced wildlife and scenic impacts. The chart on page VIII-174 makes a good case for the Coal Slurry alternate. In short, the analysis does not always seem to support the conclusions presented on pages VIII-3 through 5.

(5) Need for Power

This section of the draft environmental statement relies heavily on information put forth by the utilities and by the Federal Energy Administration. There is not much depth of analysis, nor is the subject coverage extensive. For example:

- a. No data have been provided to indicate the adequacy of the utilities' planning methods in the past.
- b. The operation of the utilities' systems as a unit is not included (times of peaks).

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- c. Interchange, interties, and energy and capacity agreements with other utilities are not discussed.
- d. The problems associated with forecasting demand are resolved by offering the readers a pick of demand growth rates and a corresponding incremental capacity needed.

In general, the demand and sales projections are unconvincing:

- a. Methodologies are not described.
- b. Economic and demographic background that should be reflected in load projections is not given.
- c. The effect of rising kwh prices is ignored.
- d. Aggregate values are given, rather than treating major classes of customers separately.
- e. The population growth projects is much above the national value (except for Southern California Edison (SCE) without explanation.
- f. Arizona Public Service and Salt River Project projected rather high growth rates for annual kwh per capita, although present values are about 40% and 50%, respectively, above the national value, without explanation.

The treatment of reserve margins is not meaningful other than different methods and criteria are in use; it is stated that SCE uses a reliability index of .95 (chance of meeting demand every hour in a year), whereas some utilities use a chance of not meeting demand of one day in ten years. These correspond to criteria that are numerically very different. The reason for the difference is not explained.





